

AUTOMOTIVE INDUSTRIES

THE AUTOMOBILE

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Automotive Industries



Good Motors Made Better

A TIMING drive should be judged purely by its contribution to motor performance, quietness, reliability, and durability.

Textolite camshaft gears maintain permanently the original relation between camshaft and crankshaft. Their low specific gravity, half that of aluminum, reduces inertia forces to a minimum during acceleration and deceleration.

Because Textolite has a high internal, mechanical hysteresis, it adds a substantial damping effect. And because it is forty times as elastic as steel, it tends to absorb and iron out vibrations interacting between camshaft and crankshaft.

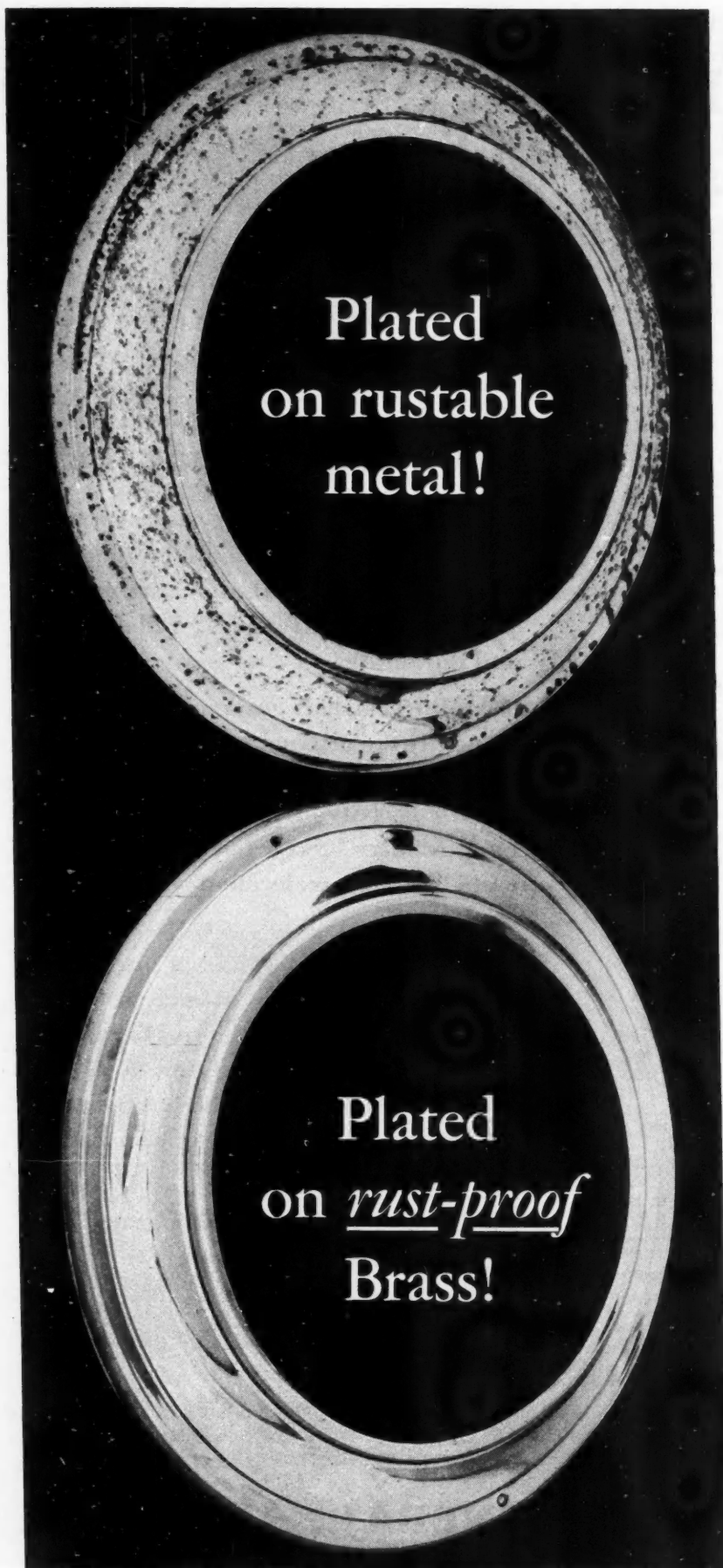
The use of a Textolite timing gear is a token of good manufacture throughout the car.



942-10

GENERAL  ELECTRIC

November 24, 1934



Plated
on rustable
metal!

Plated
on *rust-proof*
Brass!

YES!

Chromium Plate
*does retain its
good appearance
longer on*
BRASS



Two newly chromium-plated automotive parts, identical in appearance, were exposed to the outdoor air in Florida for fifteen weeks. At the end of the test one was hopelessly marred by rust, but the other was as attractive and "new" as ever, for it was plated on Brass!

These unretouched photographs show quite conclusively that chromium plate retains its good appearance longer when rust-proof Brass is used as the base metal. But, when a rustable base is substituted for Brass—inevitable disillusionment for the motor car buyer when rust sets in to mar the glistening newness of his chromium plate!

Rustless Brass for many parts costs little if any more than rustable metal. Brass is easier to form...requires less time for polishing, and fewer operations preparatory to plating. Then too, Brass has a relatively high salvage value.

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November 24, 1934

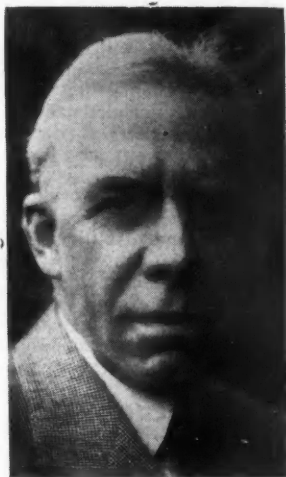
Automotive Industries

New Model Production Begun

Design Changes Step-Up Machine Tool Purchases

By Athel F. Denham

Detroit Editor, Automotive Industries



Frederick J. Haynes

Administration member of the Automobile Manufacturers Code Authority who has also been appointed Administration member (without vote) of the APEM Code Authority by the National Recovery Administration

Mixed trends, customary in automotive circles at this time of year, colored production activities during the past week. A measurable pick-up was noted in some plants due to starts on new model production. However, this upward swing was offset by other plants tapering off their production on 1934 models. Of the big three, one producer continued out of production this week, but is scheduled to get under way on a limited scale next week. A second member already has begun 1935 model output, while the third is winding up production on this year's cars. From present indications it is improbable that the latter company will get into production on next year's cars until well after the turn of the year.

November has proved to be a promising indicator of future business along lines of capital expenditures. A number of plants have entered the market with

extensive purchases of machine tool equipment. Several companies are planning plant expansions and rearrangements to take care of increased production, and partially to provide facilities for new equipment required by changes in design. An outstanding characteristic of recent machine tool purchases is the almost total absence of major acquisitions of used tools. Virtually all contemplated machinery purchases call for new tools, and a high percentage of these are demanded by engineering design changes.

New car registrations from 34 states for October show an increase of about 9 per cent for comparative states during October, 1933, actual returns being 89,598 as against 82,093.

Hudson reports dealer commitments totaling \$6,500,000 for the period to Dec. 31. Present manufacturing schedules are such, as a matter of fact, that it was necessary to refuse an additional \$1,000,000 worth of orders for November shipment. Eight territories have placed orders in excess of quotas and, as a result, schedules for the rest of November and December exceed any for these months in many years, according to William R. Tracy, general sales manager. Mr. Tracy also said that dealers are prac-

Buick Reverts to Distributors in Oregon and Washington Territories

Coincident with the creation of a new Pacific Coast region, Buick announced this week the appointment of three distributors among whom the Oregon-Washington territory has been apportioned. In California, which completes the territory comprising the new region, the Howard Automobile Co. continues as distributors.

P. S. Steenstrup, veteran Buick representative, has been named Pacific regional manager and will have his headquarters in the Federal Reserve Bank Building, San Francisco.

The addition of the three distributorships brings the number of Buick distributorships up to seven and to a certain extent marks a reversal in policy. Up to five or six years ago, Buick depended very largely upon distributor wholesaling. Subsequently, it began to replace

these distributorships with its own field sales organization until there were only four distributorships left—in New England, northern Ohio, northern Michigan and California.

Under the new set-up, Eldridge Motors, Inc., with headquarters in Seattle and Spokane, get a large part of the state of Washington, western Idaho, northern

(Turn to page 631, please)

NLRB Orders Elections at Firestone, Goodrich Plants

The National Labor Relations Board last Wednesday ordered elections to be held at the plants of the Firestone Tire & Rubber Co., and the B. F. Goodrich Co., for the purpose of determining their employees' choice of representatives in collective bargaining.



Chevrolet executives and representatives of the City of Flint gathered outside the factory to greet the 10,000,000th Chevrolet off the line. The car was presented to the Flint city government for safety patrol work.

tically sold out on 1934 models.

October shipments of the Graham-Paige showed an increase of 17½ per cent over October of last year. For the first ten months of the current year the company's shipments gained 47.1 per cent over the corresponding period of 1933.

Shipments of Hupmobiles for the first half of November were 112 per cent greater than for the corresponding period of October.

During the first nine months of this year Packard exported 43.15 per cent of all American made cars selling in this country for \$2,000 or more.

Raybestos-Manhattan, Inc.

Raybestos-Manhattan, Inc., reports a net profit of \$892,838 during the nine months ended Sept. 30, 1934, comparing with \$694,777, during the same period in the year prior.

Sunshine Top Maker Here

W. H. Bishop, managing director of Weathershields, Ltd., Birmingham, England, is in this country with the object of introducing his firm's sunshine roof. According to Mr. Bishop he has already granted manufacturing licenses to several automobile manufacturers.

Houde Case to Be Tried in U. S. Court By Justice Dept. At Instance of NLRB

The Department of Justice will seek to uphold the ruling of the National Labor Relations Board in the Houde case in an injunction proceeding which will probably be brought in the Federal District Court in Buffalo where records have been assembled. The announcement that the Department had finally decided to act on the case was made by Francis Biddle, new NLRB chairman, following a conference with the Department on Tuesday.

The injunction will be sought to enforce compliance with an NLRB ruling which directed Houde to recognize representatives elected by the majority as the exclusive bargaining agents of its workers. When the company refused to comply, NLRB cited it to the Department of Justice for violation of Section 7a.

The basic issue in the case—one of the most bitterly controverted questions arising out of the New Deal legislation and one in which there is no unanimity of opinion even in the administration—is proportional vs. majority representation.

Industry generally is insistent on the former and organized labor on the latter form of representation. It is anticipated that the proceedings to be instituted in the Houde case will lead ultimately to the U. S. Supreme Court for final determination of the law.

The Attorney General has made available to the National Labor Relations Board the research staff of the Department of Justice and in the near future will assign a man especially to handle board cases. It was also decided that wherever suits are filed they will be handled by the United States District Attorney in the districts where the suits are started under the jurisdiction of the Department of Justice.

The cooperative move between the Department and the Labor Board is a part of the intensified drive to enforce compliance with the Recovery Act. The Department staff assigned to aid the board will deal with the question of enforcement of Section 7-a. Meanwhile enforcement of other provisions of the act involving trade practices, is being actively pushed. To this end Stanley Arnold has been assigned by the attorney general to cooperate between the Department and the NRA and Division Administrator Sol A. Rosenblatt has been ap-

pointed by the National Industrial Recovery Board as Director of Field Administration and Enforcement. Mr. Rosenblatt will perform the duties of that office in addition to his present duties as Division Administrator in charge of the amusement industries. A further move toward enforcement was made by recalling William H. Davis who has agreed to act as special adviser to the board on compliance and to continue his studies in that field on condition that this work will not require his full time. Mr. Davis recently made a study of compliance problems in codes and their administration and reported his findings to the board.

Expressing confidence that the National Labor Relations Board has enough evidence to proceed with the Houde case, Mr. Biddle declared that the board decision, fixing the principle of majority representation, reflects the law and that it will be sustained. The finding, he said, made it clear that collective bargaining means dealing with spokesmen for the majority, though it does not prohibit the minority from petitioning for general objects, aside from wages, hours and working conditions. Also he said it does not recognize the right of the minority for purposes of collective bargaining.

He said that the board is working on definite recommendations for legislation with regard to Section 7-a, and that they will be submitted to Congress. Previously Mr. Biddle had said the board would ask for increased power and it is assumed that the recommendations will include request for broader authority with respect to fixing labor relations.

Oldsmobile Enlarges Plant Facilities for '35 Output

Installation of new machines, enlargement of assembly lines and rearrangement of factory equipment in the Oldsmobile plant at Lansing is calculated to give the factory a capacity of 1000 daily, according to L. C. McCuen, president and general manager. The work and new equipment is estimated to cost about \$2,500,000 and will give several months' employment to about 2000 men.

This program is being carried out, according to Mr. McCuen, in anticipation of considerably increased sales during 1935. Included in the new equipment are several new fender presses, one of which is said to be one of the two largest such machine tools in the country. New machines are also being installed in the axle plant to step-up production of independent suspension units, and new furnaces have been added to the heat treating department. Improvements are being made on the crank shaft equipment to meet 1935 requirements.

Other new equipment, Mr. McCuen says, includes machinery to give a new and finer lapping to cylinder bores and piston pins; provisions for welding the rear axle housing; new conveyors to carry motors to the final assembly line and bodies from the Fisher Body plant to the final assembly line. Another improvement is the enlargement of the export dock to care for an anticipated increased demand for Oldsmobiles from foreign markets.

Consolidate Chrysler-DeSoto-Plymouth Sales Under Frazer, Peed, Jacobson

More intensive cultivation of the market for Plymouths, particularly in small towns, is one of the prime objectives of the consolidation of sales activities on the Chrysler, DeSoto and Plymouth lines, announced this week by Walter P. Chrysler.

The status of dealers is unchanged by the move as the realignment affects only the factory selling organization.

Under the new set-up the country is divided into three sales divisions, each headed by a factory sales executive. J. W. Frazer, formerly Chrysler general sales manager, is in charge of the eastern division. L. G. Peed, erstwhile DeSoto general sales manager, heads the central division, while C. L. Jacobson, former director of factory branches, is in charge of the western division. The field sales organization in each of these geographical divisions, of course, will be assigned territorially.

Discussing the new set-up, Mr. Chrysler said: "The object of our advanced plan is to intensify and coordinate sales efforts for all Chrysler Motors divisions; to expand the Plymouth dealer activities in the smaller population units of the market, and to insure for Plymouth through Dodge, DeSoto and Chrysler dealers a deservedly large share of the sales in the lowest price field."

The Dodge selling organization apparently is not affected by the change and presumably will continue to function on about the same lines as in the past.

* * *

From the man-power standpoint, it is expected that the consolidation of Chrysler-DeSoto-Plymouth sales activities will result in one of the largest field selling organizations in the industry since it is anticipated that it will be approximately as big as the combined former Chrysler-Plymouth and DeSoto-Plymouth forces.

As a consequence, each individual salesman will have a smaller territory. The advantages of this arrangement, particularly in small towns, are more or less evident as are its drawbacks.

So far as factory operations are concerned, it is understood that they are not affected in any way and that they will be continued under the same executive direction. Harry Moock also continues as Plymouth sales manager, but the sales management function on Chrysler and DeSoto apparently is being divided among the triumvirate of divisional sales managers just named.

Olds Holds Stagger Plan Impracticable

Hits Code and Asks if Government Would Buy Surplus to "Plow Under"

Efforts of automobile manufacturers to level off the high and low periods of employment in the automobile industry by staggering the introduction of new models will fail, in the opinion of Ransom E. Olds, pioneer motor car builder and Reo chairman.

The veteran manufacturer declared Monday that the plan proposed by Alfred P. Sloan, Jr., president of General Motors, and others, is not practical. He also criticized the automobile code, saying it interferes with business.

"The promise of 'year-round jobs' in the automobile industry sounds nice," Mr. Olds said, "but it won't work out. You can't make people buy out of season, and as the code sets a uniform price, automobile builders are prohibited from making special inducements to attract buyers."

"Under the proposed plan plants would have to have acres of buildings devoted entirely to storage space for cars built

in the slack season. It has been suggested that the government buy the surplus, but what would they do, plow them under?"

Dealer Code Case to Go Before U.S. Supreme Court

The constitutionality of the Motor Vehicle Retailing Code will be tested before the United States Supreme Court Dec. 8 when the Spielman Motor Sales Co., Inc., of Brooklyn, N. Y., case is called for hearing. The principal question involved in the action is the provision in the code governing trade-in allowances.

Last month the Spielman company sought an injunction against this provision in the dealers' code and failed. An appeal was filed Nov. 10 and the contention put forward that the Shackle Act, New York enabling law to the NRA, is unconstitutional. This case will be the first test of the dealer code before the nation's highest tribunal, and, providing two other cases higher up on the docket are not called, will be the first NRA case to come before the justices.

Reveal Systematic Thefts From Buick, AC Plants

After several months of investigation Flint police have uncovered a systematic looting of the Buick and AC Sparkplug plants in that city, involving parts and raw materials amounting to more than \$100,000. Seven men already have been taken into custody, four on specific charges and three for questioning, and it is intimated other arrests are to follow soon.

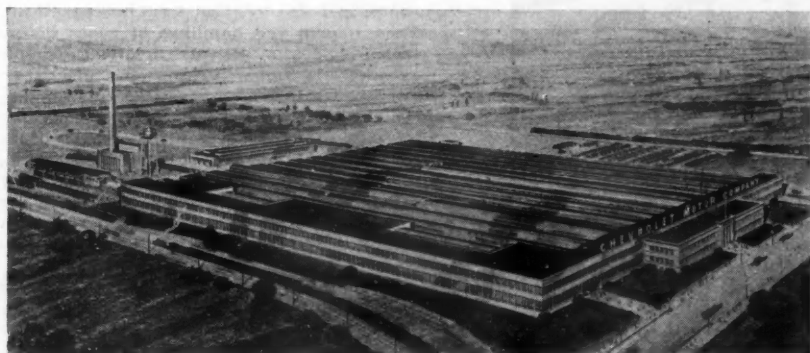
According to the policy the stolen parts and materials were packed in tool boxes, hoisted onto motor trucks and taken to prearranged rendezvous and sold for cash. Another method was to throw the stolen stuff through open plant windows to confederates waiting on the outside.

Dr. Peck to Handle Code Employment Problems

The National Industrial Recovery Board has appointed Dr. Gustav Peck as assistant to the administrative officer on employment problems in codes and their administration. This appointment is in line with the Board's policy of allotting specific problems to personnel well versed in the subjects assigned them.

Checker Cab Corp.

The Checker Cab Manufacturing Corp. reports an indicated net loss of \$441,469 for the nine months of this year ending Sept. 30; this compares with a \$299,199 net loss for the corresponding period of 1933.



Architect's drawing of the Chevrolet assembly plant being erected near Camp Holabird, Md.

MEMA Defers Actions on BUYmanship Plan Adopted Unanimously by MEWA

Cleveland, Nov. 21.—Members of the Motor and Equipment Manufacturers Association at the organization's annual meeting held here in conjunction with the Automotive Service Industries Show this week, voted to take no formal action on the group-buying "BUYmanship" plan of the Motor and Equipment Wholesalers Association until the program is more definitely settled. Conferences between the MEMA Wholesalers' Relations committee and the MEWA Manufacturers' Relations committee later this week are expected to provide the manufacturers with more concrete information.

The "BUYmanship" plan was adopted unanimously by the MEWA at the closing session of its convention. E. T. Satchell, Allentown, Pa., was reelected president of the jobbers' organization. Other officers elected were E. R. Seager, Cleveland, vice-president; Ray Sparks, Champaign, Ill., secretary, and George Lockeridge, Kansas City, treasurer.

The MEMA also reelected its president—Mason T. Rogers, Multibestos. L. L. Smith, Goodrich, was named vice-president; C. P. Brewster, K-D, treasurer, and Gordon Groth, Simmons, secretary. Directors elected were C. H. Cuno, Cuno Engineering; B. G. Close, King Quality Products; Gordon Groth, Malcolm McCormick, Walker Mfg. Co., and R. J. Rich, Simoniz Co.

At the MEMA convention, David Beecroft, Bendix, chairman of the association's legislative committee, described the work being done by the National Highway Users Conference. A. G. Drefs, McQuay-Norris, discussed patent infringement suits involving parts makers, while G. E. Weaver described the compulsory motor vehicle inspection plan in operation in Memphis.

Optimism prevailed at the Service Industries Show, the largest booth exhibit ever held with 396 exhibitors and 72,000 sq. ft. of floor space. The time, effort and money invested by the manufacturers in elaborate and effective merchandising exhibits fired the entire attendance at show and conventions with enthusiasm not present at this event in years.

Oct. Dollar Volume Gains Over '33; Behind Sept.

The daily average dollar volume of retail financing of new motor cars for October was 12 per cent higher than for the same month of 1933, according to the Department of Commerce, and 139 per cent over the corresponding month of 1932. The aggregate volume for the first 10 months of this year was 50 per cent above the corresponding period of last year and 87 per cent higher than the same period two years ago. The dollar volume of last month's retail financing, however, was a fraction more than 11 per cent below that of September, the department's report shows.

Dillon Charges GM Violates Own Policy

Union Leader Again Asks for Meeting With Sloan To Discuss Labor Problems

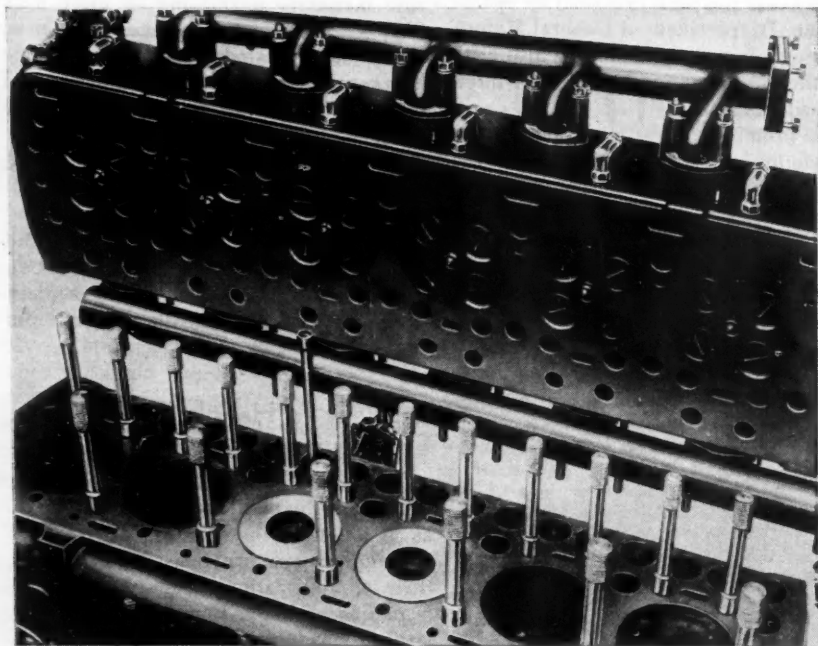
Charging that the basic labor policies established by General Motors are not being lived up to, F. J. Dillon this week repeated his request for a conference with Alfred P. Sloan, Jr. The letter is a reply to a communication from Mr. Sloan (A.I., Nov. 17, page 597) responding to the initial request for a conference, in which Mr. Sloan referred Mr. Dillon to the managements of the corporation's individual units.

An excerpt from Mr. Dillon's letter follows:

"I direct your attention to that portion of your basic policies which state 'The basic principles and policies herein set forth are to govern relations with factory employees throughout the various divisions of the General Motors Corporation.' This has not been done. Since the President's settlement of March 25th our records show that the duly accredited representatives of General Motors employees who are members of the United Automobile Workers' Unions, representing virtually every unit of your corporation, have endeavored to discuss with these several local plant managers matters which they regarded as being of mutual interest, but in each case your enunciated basic policies were not conformed to by the local management. Then too, in the handling of cases before the President's Board, involving simple questions of seniority, improper discharge, improper rehiring, as well as discriminations, they encountered the vigorous opposition of your corporation's legal counsel, which not only constituted a contradiction of the implied intent of your basic principles but likewise made impossible the functioning of the President's Board in accordance with the working people's understanding.

The fundamental trouble is that while your basic principles were being publicly acclaimed as a great forward step in industrial relations, their provisions were not being obeyed in the hearts and minds of your various factory managers when dealing with your employees."

Armstrong-Saurer Diesel Cylinder Block



The above photograph shows the cylinder block and cylinder head of a new Armstrong-Saurer Diesel engine which embodies the same features as the Saurer engine referred to in *Automotive Abstracts* of October 6. There are four valves per cylinder, the inlets being set deeply in their seats, an arrangement which is said to produce a horizontal swirl of the inlet air. Vertical air movement is induced by a heart-shaped air cell in the piston head, which is clearly visible in the two central cylinders. This three-dimensional turbulence is said to have increased the output between 12.5 and 15 per cent, as compared with a former design having two-dimensional turbulence.

Syndicate Buys Franklin Notes

Purchase Gives Virtual Control to New Company; Low-Priced Car Planned

All outstanding notes of the bankrupt H. H. Franklin Co. are reported to have been purchased by a syndicate known as Franklin Motors, Inc. The purchase of the notes, said to have been completed last week through the Chase National Bank representing the bank creditors, totals, with accrued interest, about \$2,500,000 and gives the purchasers virtual control of the defunct company.

Last week there was to have been a meeting of Franklin directors with Ben Wiles, referee in bankruptcy, to consider a proposal for the sale of the company's assets. However, because of legal and financial obstacles confronting the sale the meeting was postponed and will be held Tuesday (Nov. 27). Current reports state that the syndicate purchasing the bank notes is headed by John E. Williams, former vice-president of Franklin, and that the production of a new car to sell under \$1,000 is planned. Present plans, it is understood, call for production to get under way in time to market the cars for the spring selling season. Therefore, it is pointed out, it will be necessary to complete all details of sale of the company's assets not later than this month.



Principal figures in Buick's sales organization realignment. From left to right are Harlow H. Curtice, Buick president, W. F. Hufstader, Buick general sales manager; P. S. Steenstrup, new regional manager for the Pacific states; G. A. Braley, president of Braley & Graham, Inc., Portland, Oregon; A. S. Eldridge, president, Eldridge Motors, Inc., Seattle and Spokane, and R. A. Mueller, president, Mueller-Harkins Motor Company. The latter three are the new Buick distributors.

Some problems have arisen regarding general creditors of Franklin, but it is said their claims total only about \$30,000 or \$40,000 and it is understood that with the purchase of the notes, the purchasing syndicate is now in a position to come to an agreement with these creditors.

Buick Reverts to Distributors in West

(Continued from page 627)

Oregon and Alaska. For this organization, taking over the distributing function represents the resumption of an old role since it was Buick distributor in the Washington territory from 1912 to 1929, Buick's own field organization taking over the job in the latter year.

Mueller-Harkins Motor Co. of Tacoma will distribute in southeastern Washington including the following counties: Gray's Harbor, Lewis, Mason, Pacific, Thurston, Clallam, Jefferson, Kitsap and Pierce.

In Oregon and in the five Columbia River counties in Washington, Braley & Graham, Inc., of Portland will function as distributors.

Mr. Steenstrup has been associated with the industry for more than 30 years, 25 of which have been with General Motors and nearly 20 with Buick. Prior to his promotion he was Buick representative in the West Coast area.

Commerce Chamber Opposes Work Hour Limitations

A definite stand against the uniform 30-hr. week or any other limitation of hours of labor by statutory methods has been taken by the committee on manufacture of the Chamber of Commerce of the United States in a report sent to the Chamber's membership. The committee held that to secure a maximum volume of business and employment hour and wage standards must be suited to the requirements of each enterprise.

NSPA in Two-Day Convention Elects Officers, Directors for Next Year

With the election of officers and directors for the ensuing year, approximately 500 jobber and manufacturer members of the National Standard Parts Association concluded their annual two-day convention in the Hotel Hollenden, Cleveland, last Saturday. The meetings were well attended and according to E. P. Chalfant, executive vice-president of the N.S.P.A., it is likely that a record attendance will be established.

Unusual interest was exhibited by participating jobbers and manufacturers in the discussion of new problems which confront the independent manufacturers and wholesalers as the results of increased competition from chain stores, mail order houses, car dealers and distributors.

In accordance with the association's regular plan of alternating manufacturers and jobbers in elective offices the following were elected by the membership for the ensuing year: D. W. Rodger, Federal Mogul Corp., president; J. P. Muller, Fort Worth Wheel & Rim Co., senior vice president; L. F. Hun-

derup, Van Norman Machine Tool Co., junior vice president.

To fill expirations on the N.S.P.A. board of 18 directors, one-third of whom are replaced annually, the following were elected: J. Fischer, Auto Parts and Gear Co.; R. A. Bachman, Bee, Inc.; Wm. Christie, Christie & Thomson; H. B. Truslow, Richmond Auto Parts Co.; C. A. Grainger, Allbestos Corp. and F. C. Kip, Automotive Thrust Bearings Corp.

Zweiner Appointed Hupp Co. Treasurer

William Zweiner, formerly comptroller of Continental Motors Corp., has been appointed treasurer of Hupp Motor Car Corp., Rufus S. Cole, executive vice-president and general manager of Hupp, has announced. Mr. Cole also announced the appointment of A. C. Rogers as superintendent of body and assembly plants on the staff of A. J. Brandt, who was recently appointed assistant general manager in charge of manufacturing, purchasing and engineering.

The Horizons of B

Inflation

IN our last discussion we considered the effects of the election on national policy and in particular the prospects for inflation. During the past 18 months the position of the inflationists has developed certain elements of weakness. Chief among these is the record left by monetary experiments already undertaken.

Damaging Experience

Professor Warren sold the administration the theory that prices could be raised if the gold content of the dollar were reduced. The theory has had substantial though by no means complete test. Prices have risen. Unfortunately for the theory the rise which has taken place seems quite clearly to be due to other causes than the diminished gold in the dollar. Agricultural products have mounted but here the AAA with its program of restriction and nature through its failure to provide adequate rainfall seem convincingly responsible. Every industry operating under a code has experienced a rise in labor and material costs due again to governmental measures which have no remote relation to the monetary step taken on the advice of Doctor Warren. Our exports have been aided to some extent by the depreciation of the dollar and certain imported commodities, notably rubber and tin, have increased in terms of dollars for the same reason. On the whole the record is most disappointing.

Oriental Buying Power

Experience has dealt an even more devastating blow to the cause

of silver. For years the friends of the white metal have maintained that a rise in silver prices would promote the buying power of oriental masses who use it for money, that this greater buying power would be satisfied in the United States in the form of farm commodity purchases, thus making almost everybody happy.

The limited experience under the Silver Purchase Act shows that the drain of silver from the orient has raised the buying power of silver to be sure. An increase in the buying power of money is merely a definition for deflation. The proverbial cleverness of the Chinese has not enabled them to avoid the consequences of declining prices with the result that China is most unhappy over the American silver program. The matter has been the subject of vigorous diplomatic representations. The unkindest cut was inflicted by the last report of our exports. All the world has increased its purchases of American goods except China. Thus considerable mental agility must be displayed by the inflationists to restore the breaches which experience has made in their case.

Superior Knowledge of Inflationists

On the other side the inflationists are far better equipped to press their case than they have been at any time in the past. The banner of cheaper money in previous emergencies has always been carried by spokesmen whose knowledge of the subject fell seriously below their enthusiasm. The case which such advocates as Coin and William Jennings Bryan

pressed was crude intellectually however polished it may have been oratorically. For the most part these earlier proponents urged a naive form of currency inflation.

The men who advocate price "control" today are students. A man like Jeff Busby of Mississippi can engage the Secretary of Treasury in dispute over monetary theory and practice and route him with ease. It has been done.

Here for example are three important items of monetary knowledge which every able inflationist has at his finger tips. They relate to the position of currency in our monetary and credit system, the role of bank credit in inflation and the intangible dimensions of the total monetary supply. Consider these in their order.

Greenback Inflation

These men understand thoroughly that an issue of two or three billion dollars in currency while inflationary in tendency is not likely to be very effective in stimulating prices. The reason is to be found in the declining importance of currency as a medium of exchange in this country. The important changes which take place in aggregate liquid buying power assume the form of bank deposits and not currency.

Normally the country in the late twenties had approximately 50 million of bank deposits and five billion of currency. Most of these bank deposits either immediately or after short notice could be drawn upon and circulated in payment of goods, services and capital items. Currency was used only where a bank check was impracticable, i. e., for small transactions, for travel and for those unusual occasions where cash rather than a bank draft was necessary. Anywhere from 90 to 85 per cent

Business

by Joseph Stagg Lawrence

of all transactions were settled by check.

Thus if the Treasury complying with the law were to place three billion greenbacks in circulation in payment of salaries and services the excess currency over and above that which recipients reserved for their normal use would be deposited at once in the banks. The buying power represented by the money would now be in the form of a deposit. The bank receiving the cash finding no demand for it from their clients would send it on to the Federal Reserve Bank of the district. There the sum would be credited to the reserve account of the bank which had received it, let us say, from a government employee.

The new dollars, therefore, end up as excess reserves of member banks. Assuming a rising demand for credit from business these excess reserves might furnish the base for a secondary inflation. Their use for this purpose is doubtful. In 1929 when the country still had a gold dollar containing 23.22 grains of the metal and the Government debt, convertible by banks into reserves, was more than 10 billion less than it is today, the great demand for credit by the security markets and business still left substantial portions of central bank reserves unused. The point we make here is that intelligent inflationists are under no illusions regarding the efficacy of a three billion currency emission as a price raising force.

Banks and Credit Control

The second point at which superior knowledge comes to the aid of the inflationists is in their grasp of bank credit, its origin and the causes of expansion and contraction. The borrower who went to a State bank before the Civil War

received the proceeds of his loan in the form of the bank's own notes. These were, in effect, circulating negotiable checks payable on demand by the bank. Their value obviously depended on the status of the bank and there were as many kinds of bank notes as there were banks. The abuses growing out of this currency license is no part of our story. When Congress established the National banking system it wisely decided to put an end to State bank notes which was accomplished by imposing a 10 per cent tax.

Growth of Checking Accounts

In the seventies and eighties the national banks developed the use of checking accounts and the greater convenience of the check as compared to currency led eventually to the present eminence of the circulating bank deposit as a means of payment. Now when 19 transactions out of every 20 are settled by check and the funds against which the check is drawn are the result of a bank loan then the banks and not the Government are providing the circulating medium. As the inflationists might well express the matter the banks have usurped a sovereign prerogative of the State.

An increase in circulating deposits results when the banks increase their loans and investments and decrease when the banks reverse that policy. At the peak of the boom deposits in our banks aggregated approximately 57 billion. By the time the bottom of the depression had been reached this prodigious circulating media had dropped 20 billion. Pointing to

this decline the inflationists charge the banks with responsibility for the depression. That the decline may well have been the result of a prior decline in business and security values these students are not always prepared to admit. The point we make is that these men now know enough about this complex subject to be able to address some embarrassing arguments on behalf of inflation.

Having established to their own satisfaction at least the usurpation of the State's currency functions by the banks these advocates urge that banks henceforth be restricted to the purchase of Government securities, that the Government in turn be the sole arbiter of the amount of credit which should be extended to business and that it alone should decide to whom it may be granted.

Velocity of Credit

Finally the inflationists now understand better than many of the conservatives the role of turnover in the total supply of liquid buying power. If a deposit of \$100 turns over 12 times in the course of a year it accounts for \$1,200 worth of purchases. If it turns over only six times then aggregate purchases are but \$600. Some of the inflationists, therefore, have devised trick expedients with which to stimulate the velocity of currency and bank credit.

The point of these comments is that better informed inflationists are able now to contrive arguments and create schemes which tend to confound the conservative who has not kept one jump ahead of his opponent.

10 Months Production—U. S. and Canada

	Cars	Trucks	Total
October, 1934	86,628	49,640	136,268
September, 1934	128,120	46,331	174,451
October, 1933	107,593	30,772	138,365
10 Mos., 1934	2,105,636	523,909	2,629,545
10 Mos., 1933	1,530,539	308,641	1,839,180

American LaFrance Will Reorganize Under New Act

The American LaFrance & Foamite Corp. has filed a petition with the United States District Court in New York asking permission to reorganize under Section 77-b of the new Bankruptcy Act. Officials of the company explained that while the company is solvent at the present time, finances are in such condition that it will be unable to meet its obligations when they mature.

Charles B. Rose, president of the corporation, signed the petition with the authorization of the board of directors. Federal Judge William Bondy, who received the petition, signed a preliminary order continuing the present management of the company in charge of the business and operations.

The corporation's June 30, 1934, balance sheet estimated assets at \$8,863,243. The listing of outstanding stock as a liability shows a paper deficit of \$2,537,348.

Albert E. Doman

In failing health for four months, Albert E. Doman, chief engineer of the Owen-Dyneto Company, Syracuse, N. Y., died at his home in Elbridge, Nov. 12.

Born in Maiden Bradley, England, Nov. 5, 1870, at an early age he came with his family to this country, settling in Elbridge. In 1890 with his brother, Lewis B. Doman, he organized the Elbridge Electrical Manufacturing Company. This company was one of the pioneers in the development of automotive electrical equipment, including spark coils, spark plugs, generators, and starters. In 1910 the Elbridge Electrical Manufacturing Company was reorganized as the Dyneto Electric Company and three years later moved into Syracuse, N. Y. Mr. Doman served as vice-president and chief engineer of this company until 1919, when he resigned to form the Doman Development Company. In 1928 he returned to the Owen-Dyneto Company as chief engineer and held this position until his death.

Pneumatic Casings Report

Shipments of pneumatic casings for the month of September amounted to

3,182,903 casings, a decrease of 26.1 per cent below August, this year, and 9.1 per cent below September, 1933, according to the Rubber Manufacturers Association, Inc.

This organization reports production of pneumatic casings for September to be 2,935,958 casings, a decrease of 16.9 per cent under August and 26.6 per cent below September, 1933.

New Stanley Steamer Co. To Produce City-Type Bus

Reorganization for active operation of the Stanley Steam Motor Corp. is foreshadowed in an offering of 50,000 shares of participating Class A stock with a par value of \$5. The new corporation organized in Delaware would be a successor to the Stanley Motor Carriage Co. established in 1898, and will have headquarters in Chicago, with Henry J. Gahagan as president.

The new company proposes to manufacture a city-type bus with rear power plant assembly, incorporating the advantages of an aerodynamic design and recent metallurgical developments. The board of directors includes the following names: Leonard V. Newton, automotive engineer, Byllesby Engineering and Management Corp.; John H. Brause, formerly with the Stanley company as testing engineer; Alonzo Don Howe, formerly research engineer, Atlas Portland Cement Co.; Elmer G. Knox, formerly production manager, Yellow Coach Manufacturing Co., and James R. Martin, formerly with the Yellow Coach.

Williams Says Automobile Code White House Matter

WASHINGTON, Nov. 19—The handling of the automobile manufacturing code is a White House matter, S. Clay Williams, chairman of the National Industrial Recovery Board, said in a press conference held here today. It is not Mr. Williams' understanding that the NIRB has been given any instructions in connection with the handling of this code and he added that he does not know whether any steps have been taken to call a conference on the subject, referring to the President's letter to President Alvan Macauley of the Automobile Manufacturers Association

and President William Green of the A. F. of L. in which Mr. Roosevelt said he would arrange conferences with them. As reported last week in *Automotive Industries*, these conferences were not arranged prior to the President's departure for Warm Springs, Ga.

Mr. Williams also expressed the opinion that "it would be perfectly miraculous if the NIRA is re-enacted in its present form" by the next Congress. He said that the Board is not preparing recommendations to be made to Congress but said he had no doubt that when the time arrives for Congressional action, NRA will have opinions as to what should be done, and he assumes Congress will call for them.

Approve Wholesale Trade Credit Terms

Plan Effective Nov. 26;
Advance Dating Allowed
On Some Seasonal Items

The wholesale automotive trade has received approval of its maximum uniform credit terms, with dating in advance permitted on certain seasonal items from the National Recovery Administration. The approved terms, which become effective Nov. 26, follow:

"No cash discount shall be allowed after the tenth of the month for merchandise purchased during the previous month. All customers who have not paid their account in full by cash, note or trade acceptance by the twenty-fifth of the second month following date of purchase shall be placed upon a C.O.D. basis until paid.

"No seasonal items, tire chains, car heaters, anti-freeze and such additional items as any District (agency) may approve for its district, if customarily sold by the Trade on a dating basis, all invoices for the purpose of giving dating on such articles shall be construed as being billed as of the close of the dating period. Example: Anti-freeze sold in July 'as of November 1 terms; two per cent tenth prox. Last discount day December 10. If not paid by January 25, purchaser must be placed on C.O.D. basis until paid."

"On deferred payment or time basis sales: (A) There shall not be less than one-fourth cash payment. (B) No time payment shall extend over a period of more than twelve months from date of sale. (C) There shall be a legal carrying charge on the deferred balance on financing equipment conditional sales, and no member of the trade shall charge a lower rate of interest on the deferred balance than the legal rate of interest for the state wherein the sale is made. (D) No cash discount shall be allowed on any such sale. (E) No member of the Trade shall donate or absorb any portion of the expense of installing equipment. (F) Any deferred payment or time basis sale as described herein made upon conditions giving more favorable terms than those provided herein, or which is effected without duly executing the notes and/or trade acceptance as set forth above shall be in violation of the Code."

Report Acme Will Make Chrysler Parts

Canadian Acme Screw & Gear, a subsidiary of Russell Motor Car Company, Ltd., Toronto, Ont., has just imported \$100,000 worth of manufacturing equipment from the United States. This is reported to be a preliminary to a large-scale manufacturing of parts for the Chrysler Corporation of Canada.

Dodge Corp.'s Growth Traced at 20th Anniversary Luncheon

Twenty years ago—Nov. 14, 1914—the first Dodge car trundled off the assembly line, was fueled, oiled and headed toward Nashville, Tenn., to a waiting customer. Because of the pressure of work at the year's end the twentieth anniversary of the founding of the corporation was celebrated quietly with a luncheon in the factory restaurant. During the luncheon K. T. Keller, president, and other officials briefly reviewed the Corporation's history.

The company, which was founded by the Dodge brothers, Horace and John, was acquired by Walter P. Chrysler in 1928, and welded into the Chrysler Motors organization. Since its founding the Dodge concern has grown to such proportions that today it ranks as the world's fourth largest producer of passenger cars and trucks.

In the beginning, Mr. Keller told the luncheon guests, the factory occupied 900,000 square feet of floor space, while the present floor area is 5,810,426 square feet. In 1914 there were 4,000 factory workers on the Dodge payroll and this number has increased to 29,108 employees at the peak of the present year.

In the first six weeks of the company's activities in 1914, 249 cars were shipped. The following year the shipments jumped to 45,033, and mounted to 70,799 in 1916. The 100,000 mark was reached in 1917. During this nation's participation in the World War the Dodge plants built 85,459 motor vehicles, and in addition turned out recoil mechanisms for the 155 mm. howitzers and the 155 mm. guns needed to equip the A.E.F.

It was on July 1, 1920, that the

500,000th Dodge came off the line, and Dodge No. 1,000,000 rolled away December 12, 1923. Somewhat less than four years later the two million mark was reached, and factory officials say that the date of the 3,000,000th is not far off.

The current chapter in Dodge history began July 30, 1928, when the corporation was acquired by the Chrysler interests and Mr. Keller was placed in charge of the property. Prior to that time Mr. Keller had been supervising manufacturing operations for the Chrysler Corp.



Walter P. Chrysler,
president of Chrysler Motors, of
which Dodge has been a subsidiary
since 1928

Coincident with the rehabilitation of factory operations plans were formulated which completely reorganized the Dodge dealer organization to the point where, today, it is the third largest in the country in point of sales.

Roper Council Studying Unemployment Insurance

At its meeting last Thursday, the Business Advisory and Planning Council announced that it will meet with President Roosevelt, probably at the time of the council's next meeting in December, to discuss problems of current importance with which the council is dealing. The council was created in June, 1933, by Secretary of Commerce Roper, in order that the Department of Commerce might avail itself of the experience and opinions of representative business leaders in the United States. The purpose of the council is to advise with the Secretary of Commerce on departmental af-



Founders
The late John F. (left) and
Horace Dodge

fairs and to present the "business man's point-of-view on questions of national importance through proper administrative channels."

Especially active at the present time is the Committee on Social Legislation, under the chairmanship of Ralph E. Flanders, president, Jones & Lamson Machine Co., which is seeking to formulate unemployment insurance legislation. The committee is working in close cooperation with the technical board of the President's Committee on Economic Security, in order to make recommendations of business concerning legislation on unemployment reserves. The President's Committee on Economic Security at its meeting here last week discussed this and other social legislation.

Highfield GM Manager

The appointment of J. B. Highfield as manager of the north plant has been announced following the completion of the construction program of General Motors, Ltd., of Oshawa, Ont. Mr. Highfield has been connected with the automotive industry for more than 20 years. He has been associated with the American Body Corp., Chrysler Corp., Canadian Top and Body Co., and at the Walkerville, Ont., plant of General Motors Trucks.

W-O Canadian Plant to Continue Idle

The Willys-Overland schedule of 15,000 cars, now being made at the Toledo plant, has no effect upon the Canadian branch of the company, a subsidiary of the Russell Motor Car Co., Ltd. It is understood the Canadian company will not resume operations until the American company has demonstrated that it can permanently continue in business.



K. T. Keller,
president of Dodge Bros., Inc.

Automotive Buying Better Steel Output

**Alloy, Cold Finished
Bars on Uptrend; Pig
Rates Rise Over Oct.**

Moderate improvement of the rate at which finishing mills are operating this week reflected continuance of consistent support of the steel market by automotive consumers. Tonnages on the books of strip as well as sheet rollers are indicative of a slow, but steady broadening of automotive demand. Shipments by automotive alloy steel mills and cold-finished steel bar specialists are also on the uptrend. Wire buying by wheel manufacturers is of a routine character. The same may be said of bolts and nuts.

A statement by one of the outstanding figures in the steel industry, forecasting continuance of prevailing price levels, has further strengthened the impression that the period for filing first quarter 1935 prices, now under way, will virtually leave the market's price structure in its present form. An estimate by the American Iron and Steel Institute that the steel industry lost \$6.10 on each ton of steel ingots produced in the third quarter of the year fails to point out the relative character of the ingot yardstick.

Buying steel in a much more highly finished form than ingots, automotive consumers are entitled to recognition for furnishing a much more profitable market for steel products than do industries that consume steel in cruder forms. The margin on finishing operations entailed in the production of the descriptions of steel used by automotive consumers served to whittle down the acute losses that the steel industry suffered in the third quarter as the result of the virtual absence from the market of tonnage buyers of the more common forms of steel.

From the steel industry's point of view, the outlook for the first quarter of 1935, compared with that now entering upon its final phase, is rather encouraging, but visibility continues low for the re-

mainder of 1935. Uncertainty surrounds the future of the National Industrial Recovery Act as a whole, after Congress gets down to deal with the problem, and the steel industry is especially concerned about this. Of more immediate interest, however, is the report on basing points in the steel industry, which is looked for from the Federal Trade Commission and National Industrial Recovery Board some time next month.

Pig Iron—Automotive foundries in the Middle West are taking in iron at the rate of about 25 per cent more than they did in October. So far no changes in prices have been filed.

Aluminum—Automotive demand has improved. Market firm.

Copper—While home consumption is light, the market shows a better face, due chiefly to somewhat higher export prices. The leading fabricator of copper and brass products has announced another reduction, affecting rolled and drawn brass products to the extent of $\frac{1}{4}$ to $\frac{1}{2}$ cent per pound.

Tin—Straits tin was quoted at 51.10 cents at the week's opening, with the market intensely dull.

Lead—Statistical position of the market, disclosing rather heavy stocks, resulted in price reductions. On Monday, with the two leading marketers quoting 3.50 cents, New York, storage battery manufacturers bought freely.

Zinc—Easier amid moderate demand.

New Hours Averaging Period Starts for APEM

The APEM code authority has issued a bulletin to all manufacturers coming under that code informing them that the code did not expire Nov. 18, but continues in force until June 16, the expiration date of the Recovery Act. However, the first annual averaging period under the code expired last Tuesday. Manufacturers are advised that they should start all employees on clean sheets so far as hours worked are concerned.

Bohn Moves Offices

Bohn Aluminum and Brass Corp. has moved its general and executive offices from No. 1 plant, 2512 East Grand Blvd., Detroit, to the Lafayette Bldg., Detroit.

Survey Cars to Fix Drawback Eligibility

**Manufacturers Submit
Qualification Claims
To Canadian Officials**

With the change in the drawback regulations on automobile parts still the center of acute controversy at Ottawa, Ont., it is learned the Department of National Revenue has no intention of reverting to the former practice. The change in the regulations brought enforcement of the tariff into conformity with the law.

For several years the department had been ignoring the letter of the law. The Customs Tariff Act says, as directly as language permits, that drawbacks on duty paid shall only be given where the finished article is 50 per cent Canadian wages and/or material. But the department has been permitting automobile manufacturers to strike a balance on the entire output of their factories. One or two models might be very high in Canadian content and enable other models to qualify. The new regulation declares that each model must be judged separately.

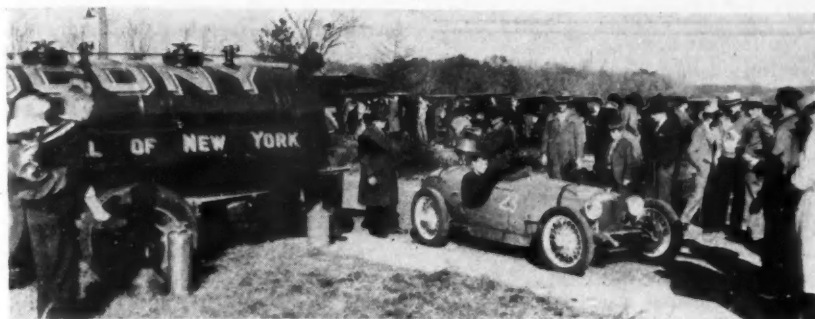
In *Automotive Industries* of Nov. 17 it was said that only two Canadian cars would now qualify for the drawback. These were named as Ford and Chevrolet. The statement was based on official views. Since then other manufacturers have claimed to be in a position to qualify. The department concedes that Ford and Chevrolet will qualify on the 50 per cent test but, so far, is not prepared to extend this list, with the possible exceptions of Plymouth and Dodge.

It is learned that departmental investigations are now under way to determine which cars are entitled to the drawback. Until the investigations are complete, there will be no official information available. It is pointed out, however, that the Buick has qualified for some years for export to the United Kingdom under a 50 per cent Empire content clause. There is, therefore, reason to believe that this car will also qualify under a strict interpretation of the Canadian act. Other makes are said to be in the same position.

Meanwhile, Canadian automobile manufacturers, through the Canadian Automobile Chamber of Commerce, have presented a memorandum to the Hon. E. N. Rhodes and Hon. R. C. Matthews, asking that a commission be appointed to investigate the automobile industry in Canada. In this memorandum it is claimed that many changes in duties and amount of drawback have been made since the original act was passed, and that the new ruling may result in increased importation of complete cars to the detriment of Canadian workmen and Canadian parts manufacturers. In this plea, the automobile industry is supported by the Canadian parts manufac-



A license plate seal which would make it possible to use the same plates for a number of years and which is expected to eliminate certain corrupt practices, such as theft of plates or transferring them from one car to another, has been developed by A. J. Krebs of Washington, D. C. The Bakelite molded loxseals, which carry the year mark, would be renewed annually.



Langdon Quimby, winner of the 100 mile road race for the Briarcliff trophy, drove his Willys 77 over the course in 2:07:30. The race was sponsored by the Automobile Racing Club of America, an organization of amateur racing drivers

turers, the latter being represented in the deputation which waited on Messrs. Rhodes and Matthews.

There is another and even more important aspect to the change in the enforcement of the act. Under the Special War Revenue Act, a luxury tax was placed on such automobiles as cannot comply with the Canadian content provisions of the customs tariff. This tax was 5 per cent on cars up to \$1,200 in value and 10 per cent on cars valued in excess of that figure. In the past the excise officials have kept their method of enforcement in line with the customs regulations. For that reason the luxury taxes were imposed on the same basis as the drawback items were administered. Enforcement was on plants and not on individual cars. But the luxury taxes will now be enforced on individual models and all those unable to qualify will have to pay.

W-O Recalls 150 Men to Forge Department

More than 150 workers were recalled to the forge department of the Willys-Overland on Monday and D. R. Wilson, receiver, said he expected to have the production line moving by the end of the week. He plans to have about 2500 workmen employed at the end of the month. The current schedule of 15,000 units will be completed early next summer.

Langston With Ex-Cell-O

Sidney Langston has been appointed representative in charge of the Cleveland territory by the Ex-Cell-O Aircraft & Tool Corp. For the past seven years, Mr. Langston has represented Kearney & Trecker in this same territory. Previously he had been associated with Pratt & Whitney in their sales office in Cleveland.

H. L. Horning In Europe For Business Conferences

H. L. Horning, president of Waukesha Motor Co., and J. B. Fisher, Waukesha chief engineer, have gone to Europe for a six weeks business trip. Conferences will be held with K. J. E. Hesselman of the Hesselman Motor Corp. and G. D. Boerlage of Royal Dutch Shell. Mr. Horning also will go to London to discuss the possibilities of Waukesha opening an office in that city.

Wagner Will Introduce New Labor Bill "With Teeth" at Congressional Session

Reports that efforts to reach an alleged truce between the steel industry and the Amalgamated Association of Iron, Steel and Tin Workers were deadlocked, the appointment of Francis Biddle of Philadelphia as chairman of the National Labor Relations Board and announcement by Senator Robert F. Wagner that a labor bill "with teeth in it" will be enacted by the new Congress, were major developments on the labor front during the past week.

Although the appointment of Mr. Biddle had been opposed by the Pennsylvania Federation of Labor, his endorsement of majority representation and his statement that he proposes to pursue the policies of Lloyd K. Garrison, his predecessor, had a placating effect as did his declaration that the power of the board should be increased.

About the same time Senator Wagner issued a statement that he is preparing to reintroduce his labor disputes bill, virtually without change.

President Roosevelt never went on record for or against the Wagner labor disputes bill. It was the general un-

Pontiac Announces New Regional Offices, Managers

Changes in Pontiac's organization and personnel, necessitated by the establishment of separate field forces by this company and Buick, have been announced by H. J. Klingler, president of Pontiac. The new Pontiac arrangement comprises four regional headquarters and 22 zone offices.

Under the new organization the Pontiac regions are to be known as the Atlantic, Central, Midwest and Pacific, with headquarters in New York, Detroit, Chicago and Oakland, California, respectively. The managers of the four regions are F. C. Sibley, formerly Boston zone manager; V. L. Murray, formerly Detroit regional manager; Allan Wright, formerly manager of the old mid-western region at Kansas City, and T. M. Ray, who continues in charge of the Pacific region.

Briggs Heads Zoo Body

Walter O. Briggs, chairman and president of the Briggs Manufacturing Co., has been elected president of the Detroit Zoological Park Commission, it was announced Saturday. He replaces William T. Barbour, who remains a member of the commission.

derstanding, however, that the Administration was opposed to it and that it was responsible for the passage of the so-called compromise Wagner joint resolution. On that assumption it is held that the President would not get back of the labor disputes bill. On the contrary, it is claimed that to do so would be entirely out of keeping with the evident moves being made between the Administration and industry to cooperate more closely for recovery.

Whatever may be done with regard to the Wagner labor disputes bill, it is believed the next Congress will be urged by the National Labor Relations Board to increase the latter's power. Mr. Biddle's conviction that the board's power should be increased is shared by the two other members of the board, Dr. Harry A. Mills and Edwin S. Smith, and therefore the board is expected to ask for such legislation. It is thought it will take the nature of authorizing the board to subpoena witnesses, compel testimony and turn over to courts firms or individuals refusing to abide by the board's decisions.

Business in Brief

Written by the Guaranty Trust Co., New York, exclusively for Automotive Industries

The moderate improvement in general business activity continued last week. Wholesale and retail trade was in greater volume; retail business, aided by the colder weather, was the largest since early spring. The leading industries showed an upward trend, with steel operations increasing for the fourth successive week.

Freight Loadings Down

Railway freight loadings during the week ended Nov. 10 totaled 594,932 cars, which marks a decrease of 17,525 cars below those during the preceding week, an increase of 11,859 cars above those a year ago, and an increase of 58,245 cars above those two years ago. The current figure marks the first instance since the week ended June 30, 1933, when car loadings exceeded those in the corresponding period last year.

Food Prices Steady

According to the Bureau of Labor Statistics, the level of retail food prices showed practically no change during the two weeks ended Oct. 23. The downward tendency in average food prices lately is mostly the result of declines in meat prices.

Store Sales Increase

Sales of 22 store chains, including two mail order houses, during October were 12.6 per cent above those in the

corresponding period last year. The two mail order houses alone showed an increase of 17.8 per cent.

Current Output Gains

Production of electricity by the electric light and power industry in the United States during the week ended Nov. 10 was 3.6 per cent above that in the corresponding period last year and 5.4 per cent above that in the preceding week.

Construction Contracts Up

Construction contracts awarded in 37 eastern states during October, according to the F. W. Dodge Corporation, amounted to \$135,524,800, as against only \$110,151,200 during September and \$145,367,200 during the corresponding period last year.

Fisher's Index

Professor Fisher's index of wholesale commodity prices during the week ended Nov. 17 stood at 79, as against 78.9 the week before and 78.7 two weeks before.

Federal Reserve Statement

The consolidated statement of the Federal Reserve banks for the week ended Nov. 14 showed a decrease of \$2,000,000 in holdings of discounted bills. Holdings of bills bought in the open market and of government securities remained unchanged.

formance, all metal, cabin monoplane, powered with a Warner "Super Scarab" engine, will begin about Jan. 1, 1935. Don Luscombe, formerly with the Lambert Aircraft Corp., designed the new plane which has already been approved by the Bureau of Air Commerce. Orders for 10 airplanes have been received.

Safety Program Urged By Trucking Industry

Highway accidents will be reduced materially if a plan designed by the nation's trucking industry is made effective.

A series of recommendations to protect the health and safety of trucking employees, as well as the general public, have been submitted by the industry's National Code Authority to the National Recovery Administration.

After approval of such recommendations by NRA, they will be urged for adoption by the 200,000 members of the industry operating under the code as the first step in a national safety campaign.

The program requires the operators:

1. To eliminate drivers physically, mentally or otherwise unfit.
2. To give physical examinations to all applicants for jobs.
3. To investigate previous experience and driving records of applicants.
4. To instruct drivers of special hazards connected with their work.
5. To instruct drivers in courtesy-of-the-road.

A safety campaign intended to embrace the more than 3,000,000 trucks of all classes in the country was authorized at the recent convention of the American Trucking Associations in Chicago. This will include private operators, as well as operators for hire. Plans for this national drive are now being perfected and will get under way shortly.

Dr. J. C. Nelson, formerly of the Brookings Institute, has been retained by the national organization to work out the details of the safety program.

Teetsel and Dodge Join Keasbey & Mattison Staff

In connection with its expansion program Keasbey & Mattison Co., Ambler, Pa., has added A. C. Teetsel and W. C. Dodge, Jr., to its staff. Mr. Teetsel becomes director of research of friction materials, while Mr. Dodge is named field supervisor of friction materials.

Mr. Teetsel, starting work as a garage mechanic, has had a long experience in the field of automotive friction materials. He has been associated with a subsidiary of General Motors operating a fleet of 2200 cars, and with the Russell Manufacturing Co., brake lining manufacturers.

Mr. Dodge has had extensive experience in the sale of asbestos and allied products. More than 20 years ago Mr. Dodge was associated with Keasbey & Mattison in its New York sales office. In 1916 he joined the Atlas Asbestos Co.

of Canada, returning to the United States in 1919 to assist in the organization of the Argus Asbestos Co., which later became Ferodo & Asbestos, Inc. This latter firm subsequently was taken over by Keasbey & Mattison.

New Branch Established

Modern Machinery Works, Inc., Milwaukee, specializing in the production of crankshafts and eccentric shafts for light duty applications, has established a branch plant in Cudahy, a suburb, to take care of present and future needs.

Luscombe to Make Planes at Trenton

Luscombe Aircraft Corp. of Kansas City, Mo., has leased the hangar at Mercer Airport, Trenton, N. J., from Mercer County. Production of the Luscombe "Phantom," a two-place, high per-

In Pa. Drunks May Drive Steamrollers

Maybe there ought to be a law, but there isn't in Pennsylvania—pride of the Penns and citadel of individualism—and lush men may drive all they want to—providing it is a steamroller.

State highway patrolmen recently arrested the driver of a steamroller which ran down an embankment. The officers charged him with being intoxicated but their efforts were wasted, for a magistrate released the prisoner when it was learned there was no law in the state upon which the man could be held.



James Ruben,
representative of the Dutch Auto-
mobile Association, who came from
Holland to attend the Automotive
Service Industries Show this week
in Cleveland

Report October Business Gains More Than Seasonal

Business improvement noted in October was somewhat more than seasonal, according to the National Industrial Conference Board. While declines were registered in production, these were balanced by gains made in building and engineering construction. There was a general advance in October over September levels in distribution and retail channels, and while commodity prices showed a tendency to slip off there were rallies in the post election days. Security prices advanced during last month, but the net gain came as a result of the somewhat irregular market. For the first time since last April living costs moved downward.

The most noticeable upturn in the business picture was in residential construction. This was the first gain in construction contract awards in this building division since June. Although automotive production slumped, iron and steel output made more than normal seasonal gains, the report states. Electric power output, bituminous mining and the textile industry all showed stimulated activity after reaching a new low level in the preceding month.

Traffic Men to Review R.R. Freight Rate Petition

DETROIT, Nov. 21—The traffic managers of AMA member companies will meet in Detroit tomorrow to discuss the petition of the railroads for increased freight rates and a special charge for order bills of lading, according to James S. Marvin of the AMA. The meeting will be held in the General Motors Building.

The recent action of the National In-

dustrial Traffic League respecting regulation of motor transportation, the freight car pooling plan, sponsored by Joseph B. Eastman, Federal Coordinator of Transportation, and a number of rate matters of special interest to the automotive industry are also on the calendar for discussion. On the same day the traffic managers will attend a joint meeting with members of the Railroad Claim Conference Committee at the Recess Club.

Canadian Rusco Names Three New Officials

Several appointments of importance in connection with the operation of the Russell Manufacturing Co., Ltd., St. Johns, Que., have been made by the company. F. L. Hambly becomes general manager of the plant and also will be in charge of all sales except in the replacements department which remains in charge of F. A. Gerrard.

M. E. Learned has been named assistant treasurer and will have charge of credit and the general office. J. B. Trudeau becomes general superintendent, and will direct all production activities. Mr. Hambly, Mr. Learned and Mr. Trudeau are birthright Canadians.

Litchfield Outlines Job Insurance Plan

**Should be Flexible, Free of
of Political Manipulation,
Goodyear's President Says**

The essential requirement of any plan of unemployment insurance is that it should be flexible, susceptible to honest administration and free from provisions which might tempt the political manipulator, P. W. Litchfield, president of the Goodyear Tire & Rubber Co., told the southeastern division of the Chamber of Commerce of the United States, meeting in Birmingham, Ala., last Monday.

Mr. Litchfield told his audience quite frankly that he realized that "we are setting out on a difficult course when we endeavor to provide some perfect system of unemployment insurance." The Goodyear head suggested that the first step should be the appointment of a commission composed of the best talent in the country to make a thorough examination of all existing systems, this country's own needs and peculiarities, and then proceed to the formulation of a plan.

(Turn to page 657 please)

CALENDAR OF COMING EVENTS

SHOWS

New York Automobile Show.....	Jan. 5-12
Los Angeles Automobile Show.....	Jan. 5-13
St. Louis Automobile Show.....	Jan. 6-12
Cincinnati Automobile Show.....	Jan. 6-12
Washington Automotive Assoc., Auto- mobile Show	Jan. 12-19, 1935
Toronto, Canada Automobile Show.....	Jan. 12-19
Newark, N. J. Automobile Show.....	Jan. 12-19
Buffalo, N. Y. Automobile Show.....	Jan. 12-19
Cleveland Automobile Show.....	Jan. 12-19
Milwaukee Automobile Show.....	Jan. 12-19
Detroit Automobile Show.....	Jan. 12-19
Brooklyn, N. Y. Automobile Show.....	Jan. 14-19
Philadelphia Automobile Trade Assoc. —Automobile Show	Jan. 14-19
National Motor Boat Show, New York	Jan. 18-26
Columbus, Ohio Automobile Show.....	Jan. 19-24
San Francisco Automobile Show.....	Jan. 19-26
Baltimore—Automobile Show.....	Jan. 19-26
Boston Automobile Dealers Assoc.— Automobile Show	Jan. 19-26
Pittsburgh, Pa. Automobile Show.....	Jan. 19-26
Hartford, Conn. Automobile Show.....	Jan. 19-26
Syracuse Automobile Show	Jan. 19-26
Nashville, Tenn., Automobile Show.....	Jan. 20-26
Rochester Automobile Show.....	Jan. 21-26
Chicago Automobile Show.....	Jan. 26-Feb. 2
Montreal, Que., Automobile Show.....	Jan. 26-Feb. 2
Springfield, Mass. Automobile Show.....	Jan. 28-Feb. 2
Omaha Automobile Show.....	Feb. 3-9
Kansas City, Mo. Automobile Show.....	Feb. 9-16
Denver, Colo. Automobile Show.....	Feb. 10-23
Peoria, Ill., Automobile Show.....	Feb. 13-17
Bethlehem, Pa., Automobile Show.....	Feb. 18-23
Evansville, Ind. Automobile Show.....	Feb. 23-27
Minneapolis Automobile Show.....	Mar. 9-16
Mankato, Minn. Automobile Show.....	Mar. 16-23

MEETINGS

Society of Automotive Engineers—
Chicago (Tractor & Industrial
Power Equipment Meeting)....Dec. 5-6

ANNUAL MEETINGS

Motor & Equipment Manufacturers
Assoc., ClevelandNov. 19-23
American Society of Mechanical En-
gineers—New YorkDec. 3-8
Society of Automotive Engineers—An-
nual Banquet—New YorkJan. 7
Motorcycle & Allied Trades Assoc.,
New York CityJan. 9
American Engineering Council, Wash-
ington, D. C.Jan. 10-12
Society of Automotive Engineers—An-
nual Meeting—Detroit.....Jan. 14-18
American Roadbuilders Assoc., Wash-
ington, D. C.Jan. 22-25
Automotive Parts & Equipment Mfrs.,
Inc.—ChicagoJan. 29

CONVENTIONS

National Automobile Dealers Assn.,
DetroitJan. 14-15

EXPOSITION

Natl. Exposition of Power & Mechanical
Engineering (Biennial) New York,
N. Y.Dec. 3-8

FOREIGN SHOWS

International Aeronautic Exposition,
Paris, FranceNov. 16-Dec. 2

New Cadmium-Silver-Copper Alloys Developed by Federal Mogul Corporation

WITH the announcement by Federal Mogul Corporation of a line of cadmium-silver-copper alloys, a new type of high load capacity bearing material enters large scale automotive production. Already for 1935 three manufacturers have adopted the new metal for main bearings, including a prominent passenger car producer, a truck manufacturer and a diesel engine company.

Basically the new bearings have the same objectives as other recently announced bearing metals such as the high leaded bronzes. For the cadmium-silver-copper alloy there are claimed by the producers certain advantages over the leaded bronzes, including lower manufacturing cost, greater protection against, and less likelihood of scoring with soft shafts, greater inherent resistance to corrosion, and the claimed ability to as-

semble bearings with less running clearance than required for copper-lead types.

The function of the new bearing metal of course is to provide bearings which maintain their 'strength' better than babbitt at the high operating speeds, high crankcase temperatures, and the high bearing loads experienced with modern engines. Cadmium was selected by Federal Mogul as a promising base for such a metal since it has a melting point well above that of tin, a Brinell hardness for the pure metal of over 20, and good bonding characteristics as evidenced by the successful use of cadmium when alloyed with zinc, as a high strength solder.

Experimental work on cadmium-zinc and cadmium silver was conducted at the Battelle Memorial Institute, Columbus. Final development of the silver compositions was carried on at the Federal Mogul laboratories.

As to the constituents of the metals, silver alone when added to cadmium in relatively small quantities improves the casting qualities of cadmium by making it less susceptible to oxidation at casting temperatures. Fluidity is also improved even though the freezing temperature is somewhat raised. These are important features as the dropping of cadmium at temperatures but slightly above its melting point is quite severe.

Silver also has a marked influence upon the structural and physical characteristics of cadmium. Fig. 1 and 2 show respectively the grain

Fig. 1—(Below) Pure cadmium, etched. Magnified 100 diameters

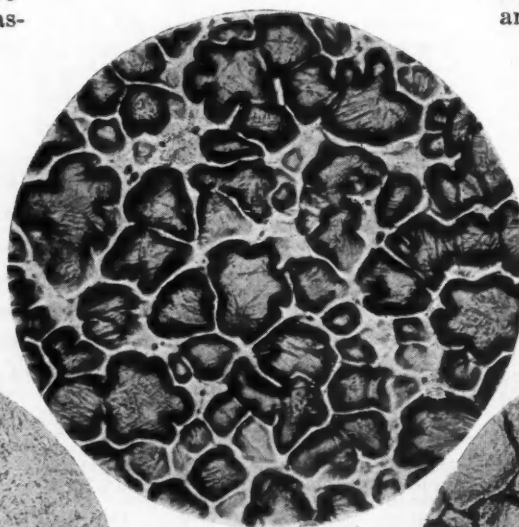
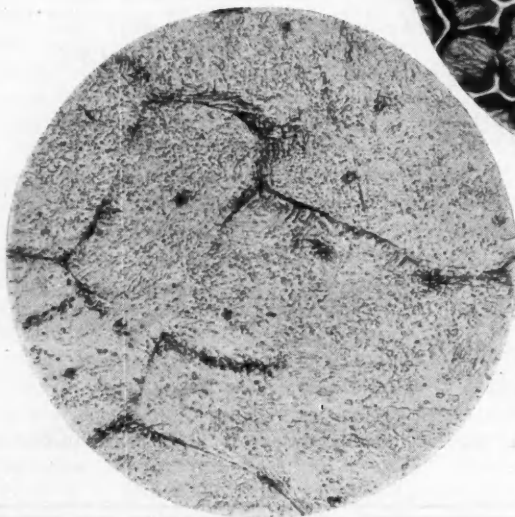


Fig. 3—(Below) Federal Mogul's C.S. 50 alloy etched. Magnified 200 diameters

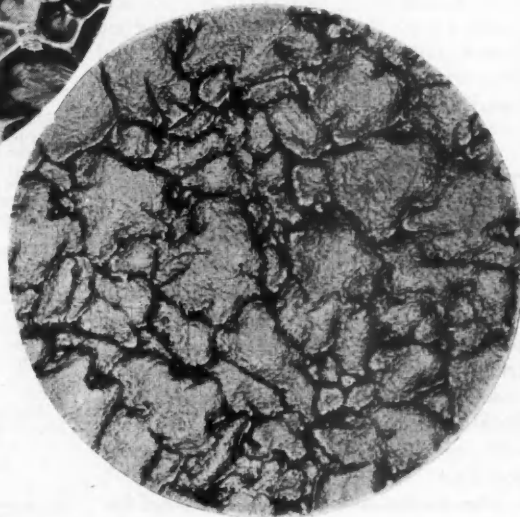


Fig. 2—(Above) Cadmium with addition of small amount of silver, etched. Magnified 200 diameters

Copper Bearing Federal-Mogul

by Athel F. Denham
Detroit Editor, Automotive Industries

structure of pure cadmium and of cadmium with the addition of a small amount of silver. All this silver is held in solution by the cadmium. The shaded appearance of the grains in Fig. 2 indicates a condition caused by rapid cooling of chill cast specimens. Hardness results quantitatively are effected somewhat by casting conditions, but there is a definite increase in Brinell of cadmium with increase in silver content, it might be stated.

This condition however, does not hold as true when copper is added. Copper of course is not soluble, in appreciable quantities, in cadmium (less than .1 per cent). Fig. 3 shows Federal Mogul's C.S.50 metal containing less than one per cent of copper. The addition of this amount of copper however was sufficient to raise the Brinell hardness by some 30 per cent, and furthermore it was found possible to materially vary and even to considerably reduce the amount of silver content without

affecting widely the hardness of the bearing metal.

The use of copper alloyed with cadmium alone, would produce an even harder bearing metal, but the resultant alloy was found to be to



Fig. 5—C.S. 50 alloy rod bearings after two 100-hr. full throttle dynamometer runs at 3500 r.p.m.

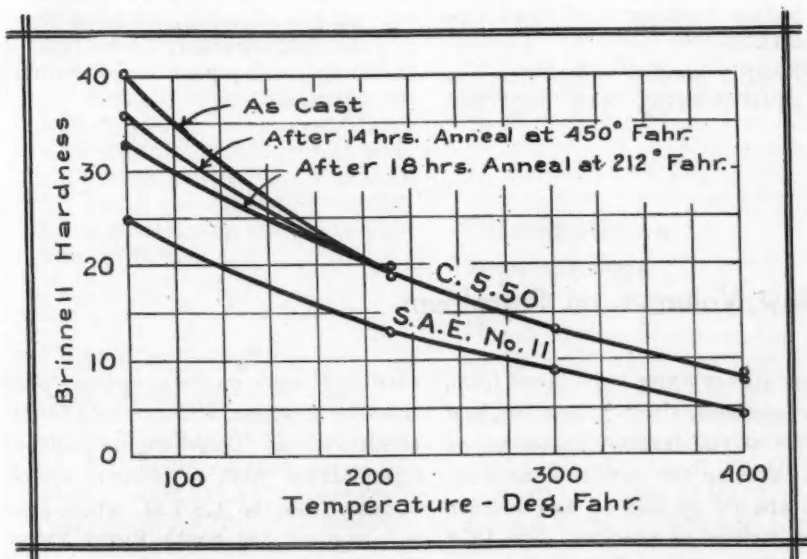


Fig. 4—Brinell hardness vs. temperature for S.A.E. 11 Babbitt and C.S. 50

brittle and therefore not particularly desirable for bearings. The addition of small amounts of silver to a theoretical cadmium-copper alloy has a 'fining' effect, and increases the ductility of the alloy.

The claimed advantages for consistency and greater ease of manufacturing as compared with high leaded bronzes is in great part due to the fact that the cadmium-silver solution and the cadmium-copper mixture do not differ materially as far as specific gravity is concerned, so that there is little tendency toward segregation, and the resultant metallographic structure is uniform in character.

The alloy has some rather unusual qualities insofar as it is affected by temperature. Primarily tests show (Fig. 4) that prolonged periods of heating at elevated temperatures have little effect on strength and hardness. Furthermore the material has a tendency to soften, as shown

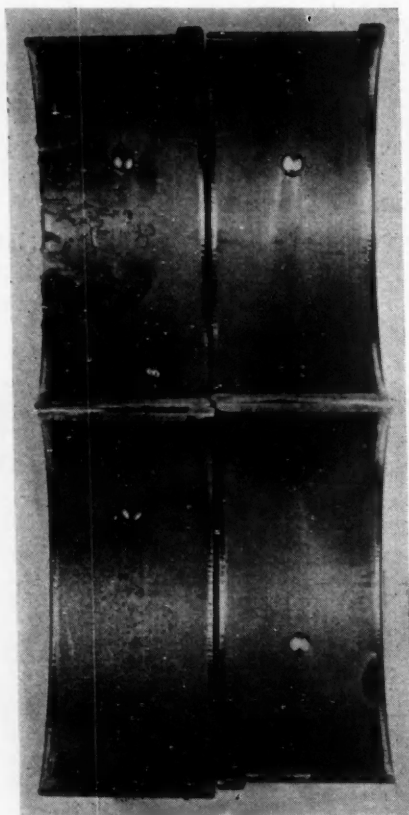


Fig. 6a—Babbitt after 20 hrs. at 4500 r.p.m. on bearing testing machine

by the chart, at around 200-250 deg. F., enabling the bearing surface to conform better to the shaft, during the break-in period. After prolonged operation at higher temperatures, however, the metal regains its hardness, and retains it subsequently, when cooled. At the elevated temperatures, hardness seems to be about the same for annealed and non-annealed specimens.

The considerable ductility of the cadmium-silver-copper alloys makes it valuable in the manufacture of thin-walled bearings. As to melting

point, the C. S. 50 standard Federal Mogul metal begins to solidify at 621 deg. F., when particles of solid solution of silver in cadmium separate from the melt. More of this solid solution is formed until at about 598 deg., the cadmium copper-eutectic forms in the grain boundaries, and the alloy becomes wholly solid. The effect of this eutectic, as stated, is to increase the stiffening and strengthening characteristics, making it possible to permit the use of small amounts of silver, without sacrificing the principle of a hard constituent in a softer matrix.

Incidentally it might be added here, that the lack of tendency toward segregation and closeness of specific gravities makes it possible to spin the metal into connecting rod lower ends or their liners.

Fig. 5 shows photographs of sample rod bearings of the C. S. 50 alloy run on a dynamometer test at full throttle, 3500 r.p.m. for 100 hours with a crankcase temperature of around 240 deg. F., followed by examination and another 100 hour test under similar conditions.

Fig. 6 (a) and (b) show respectively babbitt and C. S. 50 bearings after 20 hrs. at 4500 rpm on a bearing test machine, and show severe cracking for the babbitt bearings. While run under similar conditions, thermocouples indicated that while the babbitt bearings showed a maximum of around 298 deg. F., the C. S. metal bearings did not exceed 280 deg. F. Oil pressure was held at 40 lbs. in each case and clearances were between .001 and .00175 of diameter.

Summarizing claims for the new alloys:

1. Higher factor of safety at elevated temperatures—135 deg. higher melting point than babbitt.
2. Readily bonded and soldered to usual bearing back materials.



Fig. 6b—C.S. 50 after 20 hrs. at 4500 r.p.m. on bearing testing machine

No unusual manufacturing difficulties for bearing producers.

3. Higher physical properties than for tin-base metals at all operating temperatures.
4. Can be assembled with same clearances as babbitt bearings—does not require increased clearance.
5. Its use does not require adoption or use of hard crankshafts, as is claimed by Federal Mogul to be necessary with use of many copper base bearing metals.

Two New Volumes on Petroleum

TWO publications on petroleum products have been issued recently by the American Society for Testing Material, Philadelphia, Pa. One is the 1934 issue of A.S.T.M. Standards on Petroleum Products and Lubricants and the other a report on The Significance of Tests of Petroleum Products Prepared by A.S.T.M. Committee D-2 on Petroleum Products and Lubricants. The volume

on standards contains in its latest form, 53 test methods, six specifications, and two lists of standardized definitions of terms. Among the new standards included are one on fuel oil and another on gum content of gasoline. The 1934 report of Committee D-2 outlines its numerous recommendations on standards matters, includes interesting dis-

cussion of work on tests, and specifications for gasoline, and presents for information a Diesel-engine fuel-oil classification. Both publications are obtainable from the A.S.T.M., whose office is located at 260 South Broad Street, Philadelphia, the price of the book on standards being \$1.75 and that of the report on the significance of tests, \$1.

JUST AMONG OURSELVES

Fixing Clean-Up Price Reductions

SOME State advisory committees are beginning to question whether the code actually gives them the power to fix the amount of clean-up price reductions as many of them have been doing. And after reading the pertinent section of the code we don't blame them, since the code simply says that with the approval of his State advisory committee and the factory concerned, a dealer may cut prices to clean up inventory prior to new model introductions.

The code says nothing about how the amount of the reduction is to be set, and its silence on this score might be interpreted to mean that this was up to the dealer concerned. Certainly if State Advisory Committees had adopted this viewpoint in the beginning and let dealers make whatever price adjustment they found necessary to move the cars, they would have saved themselves a lot of trouble. Of course, the effect of so doing would have been to nullify the marketing rules of the code for the period of the clean-up. That has come close to being the result anyway, since compliance currently is at its lowest ebb. Efforts to control the situation by fixing the amount of reductions on clean-up cars have been largely futile.

* * *

"Lift-Cadgers" Still With Us

"HITCH-HIKERS (or Lift-Cadgers as they are called in England) are very common in Canada and were, until recently, in the United States," our Brit-

ish contemporary *The Motor* says. "But it is now an offence in many of the States . . . hitch-hiking is dying a natural death." A gracious but undeserved tribute to the efficiency of our law enforcement.

* * *

An Era of Good Feeling

MORE than 100 years ago James Monroe was elected President for the second time by an electoral vote of 231 to 1. With the country almost unanimously in back of him, his second term came to be known as "the era of good feeling" to distinguish it from the years of internal and external strife that had gone before.

The Roosevelt administration today is in a somewhat similar position, having just received a tremendous endorsement at the polls. Will history repeat itself with the result that the years immediately ahead also will come to be known as "the era of good feeling?"

The current rapprochement between business and the Administration is a step in the right direction.

* * *

Discrimination Against Age

THAT automotive manufacturers throw workers on the scrap heap when age begins to slow them up, is one of the stock criticisms of the industry's employment policies. It was made again recently by F. J. Dillon, Detroit organizer of the A. F. of L., in a letter to President Roosevelt.

For some months we have been trying to get the facts on the age distribution of workers on automotive payrolls for comparison with similar data for all manufacturing industries, as reported by the Census. It is beginning to look now as though our efforts will be successful and we hope to be able to present some data on the subject in the near future.

Meanwhile, we might mention that we saw some figures for one automobile company this week which indicate that it has practically no employees under 18 and that it employs less than half as many under 25 as does industry generally. In the 40 to 50-year age group, the percentage of total employees of this company was almost exactly equal to the percentage for all industries. Above 50, industry generally employs relatively somewhat more than this particular company, which perhaps is to be expected in view of the fact that the automotive industry is too young to have any very large number on its payrolls for more than 20 years.

* * *

Litchfield Urges Old Age Pensions

IF automotive employers do tend to discriminate against older workers, as their critics assert, a statement made by Goodyear President P. W. Litchfield in a recent speech in which he advocated old age pensions, would indicate that the tendency is not peculiar to the motor industry but exists in other lines.

"A better article can be produced by a young man of very short training," Mr. Litchfield said, "than formerly could be produced by an artisan of many years' practice. This has enabled very young men, without family responsibilities to command earnings equal to or greater than their elders. A situation has been created where a man in the factory reaches the peak of his earning power at a much earlier period of life than formerly. . . . This tends to make it more difficult for those who have passed the prime of life."—The Editors

Unemployment Insurance—The European Experience and the American

UNEMPLOYMENT insurance in European countries has generally developed through four stages: (1) Out-of-work benefit plans of trade unions (1850-1900); (2) Local effort to establish voluntary plans (1890-1905); (3) Local, provincial and national subsidies to voluntary plans (1896-); and (4) The period of national compulsory legislation (1911-).

In the first stage the trade unions, seeking to protect their members against the recurring depressions that followed the industrial revolution, collected contributions from the members while they were employed, for disbursement in the form of

benefits when they were out of work. The Journeymen's Steam Engine Makers' Society in England distributed benefits to members out of work as early as 1824, and in 1846 the Printers' Union of Brussels paid traveling benefits to members in search of employment. Data as to the extent of these funds are lacking, but in Great Britain alone the unions paid out millions of pounds to out-of-work members in the late decades of the nineteenth century. Perhaps the principal contribution of these plans was the development of an administrative procedure which was largely adopted by the governmental systems of unemployment in-

surance when they began to operate.

These trade union schemes were available only for union members; that is, for the group workers in the community who on the whole were the more skilled, steadily employed and better paid. The unorganized workers were left dependent on charity. Moreover, the union funds were often wholly insufficient to provide an adequate measure of protection.

Several cities on the Continent tried to parallel the development of union benefits with municipal systems designed to make provision for unorganized workers. Workers were invited to contribute to an unemployment fund subsidized and administered by the municipality. These funds appeared mainly in the last decade of the nineteenth century and the first few years of the twentieth, the earliest being established in Berne in 1893, with Basle and Zurich soon following. In Italy, Bologna had a fund in 1896 and in Germany Cologne established the first municipal fund in 1906. But workers who were employed fairly regularly were not interested, for they realized that they would contribute most and draw least in benefits. The small number who did contribute were the bad risks and most of the funds were soon abandoned.

The system of public subsidies to voluntary plans came next. Some municipalities began to subsidize trade union funds, either because these funds seemed the only form of protection that was able to survive or because of the strong local influence of the unions. In France, Dijon in 1896 and Limoges in 1897 began to pay a regular subsidy to unions granting unemployment benefits to their members. In 1901 in Belgium, the city of Ghent began to pay direct subsidies to trade union members from a communal unemployment fund. The subsidy was in the form of an additional amount of benefit paid by the union to the individual member. The Province of Liège adopted a system of subsidies to the

BRYCE M. STEWART, to whom the President's Committee on Economic Security has assigned the subject of unemployment insurance, gives here a concise picture of experience here and abroad with this form of protection. His article provides in summary form much information that will enable the busy reader quickly to get a perspective of some of the basic aspects of such insurance. Since the next Congress seems almost certain to pass some sort of unemployment insurance legislation, the timely importance of the subject is obvious.

For those who seek further information, at our request, Mr. Stewart has suggested the following short bibliography:

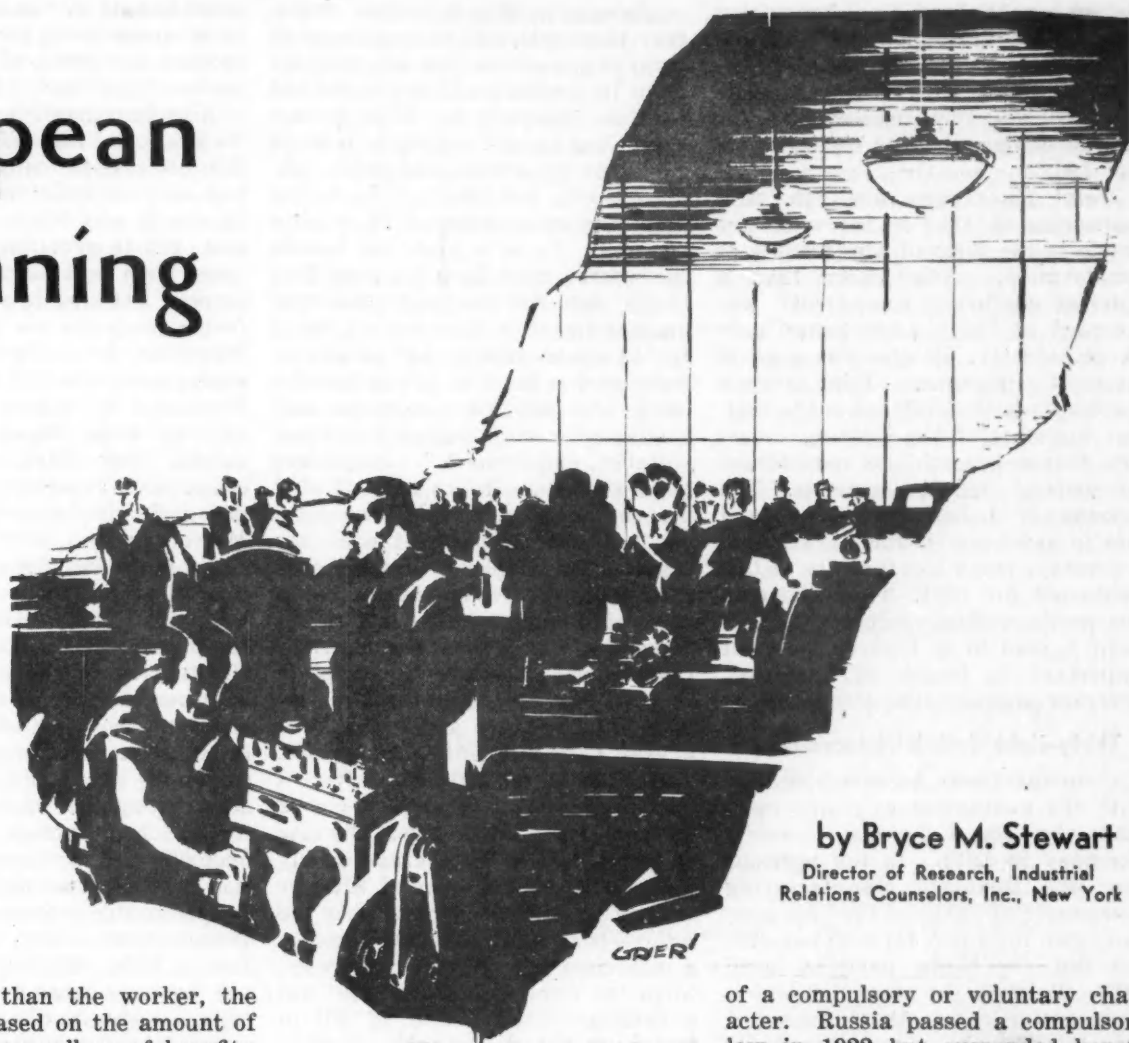
An Historical Basis for Unemployment Insurance, a report prepared for the Employment Stabilization Research Institute, University of Minnesota, by Industrial Relations Counselors, Inc. The University of Minnesota Press, Minneapolis, 1934.

A Program for Unemployment Insurance and Relief in the United States, by Alvin H. Hansen, Merrill G. Murray, Russell A. Stevenson and Bryce M. Stewart. The University of Minnesota Press, Minneapolis, 1934.

Unemployment Benefits in the United States, by Bryce M. Stewart, Industrial Relations Counselors, Inc., New York, December, 1930.

Insuring the Essentials, by Barbara N. Armstrong. Macmillan, New York, 1932.

e European n Beginning



by Bryce M. Stewart

Director of Research, Industrial
Relations Counselors, Inc., New York

union rather than the worker, the grant being based on the amount of contributions as well as of benefits.

The Ghent system spread more rapidly than that of Liège and was largely adopted by the industrial countries of Europe, though not by Great Britain. Provincial or cantonal governments began to add subsidies to those paid by the local authorities, and finally national governments began to add their subsidies. The first national subsidy was passed in France in 1905.

By the beginning of the war large numbers of workers were aided by these funds, though probably in no country did the Ghent or Liège systems apply to half the industrial wage-earners, for they still left the non-union workers unprotected.

The Swiss canton of St. Gall had attempted in 1894 to introduce compulsory unemployment insurance schemes by giving the municipalities power to set up compulsory insurance, and the municipality of St. Gall the following year established a fund into which the local workers of certain specified groups were required to contribute in proportion to their wages. After two years this fund was discontinued, for the better paid and more regularly employed

objected and many of them moved out of the community.

With the investigations of the Royal Commission on the Poor Laws in Great Britain (1905-1909) discussion of compulsory unemployment insurance was resumed. The Commission recommended compulsory unemployment insurance; a national system of employment exchanges to administer the insurance was set up under the act of 1909 and in 1911 legislation for a compulsory unemployment insurance plan applying to six industries was passed—the first national compulsory plan in any country. The scheme at first covered about 2,500,000 workers, was extended in 1916 to about 3,750,000 and in 1920 to nearly 12,000,000, or practically the entire wage-earning population except farm workers and domestic servants.

Since the British legislation was adopted, many other European countries and one state each in Australia and the United States have established unemployment insurance plans

of a compulsory or voluntary character. Russia passed a compulsory law in 1922 but suspended benefit payments in 1930. Sweden enacted voluntary legislation in the present year but it has not yet come into force. The accompanying table, arranged in order of enactment of legislation, gives the most recent figures available for total coverage under compulsory and voluntary plans:

In the United States until the passage of the Wisconsin law on unemployment reserves in 1932, all plans have been of a voluntary character. Three types are represented—trade union plans, for benefits to members from union funds; joint plans, for unemployment benefits through joint contributions under agreements between employers and unions; and company plans, for guaranteed employment or unemployment benefit paid wholly from company funds or from joint contributions with the employees.

Out-of-work benefit plans of trade unions were the earliest and a benefit plan in a printing trades union existed as early as 1831. Since then hundreds of union unemployment benefit schemes have been established, though many have disappeared. The number protected by

union benefit plans is not known, but the United States Bureau of Labor Statistics in 1934 reported 41 plans in local unions with a coverage probably considerably smaller than the 45,000 estimated in an earlier study for 1931.

Joint plans came next, the first appearing in 1894 in the wallpaper trade in the form of a guarantee of employment. After more than a quarter century a second plan was adopted in 1921 in the ladies' garment industry. It also was a guarantee of employment. Joint schemes have been most developed in the various branches of the clothing industry, though several have been forced to suspend benefit payments. The Bureau of Labor Statistics found five in existence in May, 1934, with a coverage much less than the 65,000 estimated for 1931. The scheme in the men's clothing industry in Chicago, agreed to in 1923, is the most important in length of operation, coverage and amounts distributed.

Thirty-eight Have Introduced Plans

Company plans became operative with the guarantees of employment made by the Columbia Conserve Company in 1917. In the previous year the Dennison Manufacturing Company had initiated the first company plan for unemployment benefits, but did not begin payment until 1920. Thirty-eight other companies, representing nearly that number of industries, have since introduced schemes, although five of them, including the scheme of the Dennison Manufacturing Company, have since been suspended or withdrawn. The schemes now in operation cover approximately 85,000 workers. In most of the company schemes the workers do not contribute, but in several of the more recent plans, including the largest, that of the General Electric Company, employers and employees contribute equally.

The insignificant coverage of the voluntary plans and the increasing unemployment and mounting relief costs of the present depression have brought a widespread, insistent demand for a plan of compulsory unemployment insurance on a nationwide basis. Numerous official or semi-official commissions have been appointed in different states and have reported in favor of a compulsory plan; in 1933 bills were introduced in 25 state legislatures and in Congress, and many organizations, including the American Federation of Labor, since 1932 have actively urged legislation. Wisconsin passed the first compulsory state law in 1932 to be effective July 1, 1934.

Under the Wisconsin law voluntary plans which meet certain minimum requirements may be exempted from its provisions but are subject to state supervision. With certain exceptions the act applies to persons employed by private and public employers who for four months in the preceding year employed 10 or more workers. To be eligible for benefit the worker must have been resident in the state for two years preceding unemployment or have been employed for 40 weeks during that period, be registered at the district employment office and be "physically fit and available for work, but unable to find suitable employment." Employers alone contribute to an amount of 2 per cent of the payroll for two years and thereafter 2 per cent when the reserve per employee drops below \$55; 1 per cent when the reserve is \$55 to \$75, and nothing when the reserve is \$75 or more. The contributions of each employer are kept in his own separate account in a central state fund and are accumulated for a year before benefits are payable. The unemployed worker, after a waiting period of two weeks (in 12 months), receives benefits at the rate of 50 per cent of his average weekly wage, with a maximum of \$10 per week. Full benefits are paid when the reserve per employee is \$50 or more; a maximum benefit of \$9 per week when the reserve is \$45 to \$50, and a corresponding decline of \$1 in maximum benefit for every further decline of \$5 in the reserve. The part-time worker receives the difference between his weekly earnings and the benefit to which he would be entitled if totally unemployed. The duration of benefit is for 10 weeks in a calendar year, but not more than one week's benefit may be paid for each four weeks of employment. The Wisconsin Industrial Commission administers the act through the state employment service, the cost of administration being met by an employer contribution of two-tenths of one per cent of payrolls. Appeal boards are to be set up to consider disputed claims and their decisions are reviewable by the Industrial Commission.

Among the state legislative proposals the Ohio bill has received most attention because it emphasizes protection rather than prevention, as in the Wisconsin law. Employers and employees would be required to contribute, while the whole revenue in the Wisconsin law is derived from employers. Moreover, all contributions are to be pooled in a single state fund, while the Wisconsin legislation requires that contributions

shall be held by the state, ordinarily in separate funds for individual employers, or a group of employers may have a single fund if they so request.

Bills introduced in Massachusetts, New York and Virginia follow Wisconsin in recommending non-contributory schemes, while California, Maryland and Minnesota follow the Ohio bill in providing for contributions from both employers and employees, although in general the California proposals are modeled on the Wisconsin law. The system of unemployment reserves provided for in Wisconsin is followed in proposals by California, Massachusetts, Minnesota, New York, the interstate commission representing the governors of six states (Connecticut, Massachusetts, New Jersey, New York, Ohio and Pennsylvania), and the bill proposed for the District of Columbia, while Maryland follows the proposed Ohio pooled procedure. Virginia would combine the reserve and insurance plans in providing for house reserves and also a guarantee or equalization fund, to which all employers contribute to give assurance of payment of benefits.

Various proposals to encourage unemployment compensation legislation by the states have appeared in Congress, the most recent being the Wagner-Lewis bill introduced on Feb. 5, 1934. The measure imposes a 5 per cent tax on payrolls of all private employers (except those in certain specified industries and those employing less than 10 persons), but provides that an employer may deduct from the tax the amount of any contributions paid to a state unemployment fund approved under the federal legislation.

Ten Steps of Development

The most noteworthy features in the development of unemployment insurance abroad may be summarized as follows:

1. After centuries of reliance on relief measures most of the industrial nations of Europe have established systems of unemployment insurance designed to provide the greater part of necessary unemployment relief for those industrial workers who are ordinarily regularly employed.
2. Increasing industrialization, the extent of war and post-war relief and recurring depression have largely shifted the burden of unemployment relief from the local authorities to the national governments.
3. Voluntary schemes of unemployment insurance have steadily given way in favor of national com-

pulsory legislation. In several countries the national government, lacking authority to enact compulsory laws, has tried to promote nationwide and more uniform coverage by subsidies to state and local plans.

4. The post-war increase in unemployment has made it evident that unemployment insurance must be buttressed by relief measures, and the two expedients are being synthesized into a new and broader program.

5. The higher rate of unemployment since the war and especially in the present depression has forced the national governments to take over from the local authorities an increasing proportion of the costs of unemployment relief, which has given rise to more centralized control of unemployment insurance and relief measures.

6. Because of recognition by European countries of the heavy cost of provision for unemployment and the fact that their unemployment insurance systems have been largely founded on the experience of trade union out-of-work benefit plans, employees' contributions have been required in all the national systems except the plan of the U.S.S.R., which is now in suspension.

7. Unemployment insurance coverage is being generally extended to include all wage-earners except intermittent and casual workers and persons in highly regular occupations. Seasonal workers are being included under special limitations in the general schemes or under special systems. Comparatively few special schemes have been set up in view of the need, during the period of more serious unemployment since the war, to retain the contributions of the more stable industries in the general fund.

8. The higher unemployment rate of recent years has brought consideration of the relief principle in unemployment insurance to the fore and has permitted but little attention to its preventive aspects.

9. More or less autonomous, non-political bodies are being granted some control of the administration of unemployment insurance legislation as a result of the frequent alterations in the legal and scientific structure of unemployment insurance made by legislative bodies under social pressure in periods of prolonged unemployment.

10. The important contribution of public employment services to the administration of unemployment insurance has led to greater development, strengthening and centralization of the employment office systems.

The limited American experience suggests certain basic considerations for the planning of unemployment insurance in this country:

1. Because of the costs involved in unemployment insurance, the United States in initiating a plan, by reason of its tardiness in this field, may profit by the European experience.

2. Although limited, the American experience has been sufficient to confirm the evidence of the European experimentation that voluntary plans will bring only meager coverage and that compulsory legislation is necessary to provide nation-wide protection.

3. Under the influence of the depression the emphasis on prevention that characterized the earlier consid-

eration of unemployment insurance has been declining before a broader consideration of the relief function of insurance.

4. The promoters of legislation in this country should have regard to the fact that national subsidies to state and local plans have always left some areas unprotected and have tended therefore to give way to distinctly national systems.

5. The present depression, like the post-war unemployment situations in European countries, has made it clear that in time of extraordinary unemployment the national government must assume a large part of the burden of unemployment costs. It should therefore take the initiative in establishing a program for unemployment insurance and relief.

Countries in Which Compulsory or Voluntary Unemployment Insurance Laws Have Been Passed and the Number of Workers Covered in Each

Compulsory Plans

Country	Date of Law	Number Insured
Great Britain and Northern Ireland	1911	12,770,000
Italy	1919	4,500,000
Austria	1920	979,000
Irish Free State	1920	284,000
Queensland, Austria	1922	160,000
Poland	1924	1,056,000
Switzerland (12 cantons)	1924 ^a	250,000
Bulgaria	1925	280,000
Germany	1927	17,920,000 ^b
Wisconsin, U. S. A.	1932

Voluntary Plans

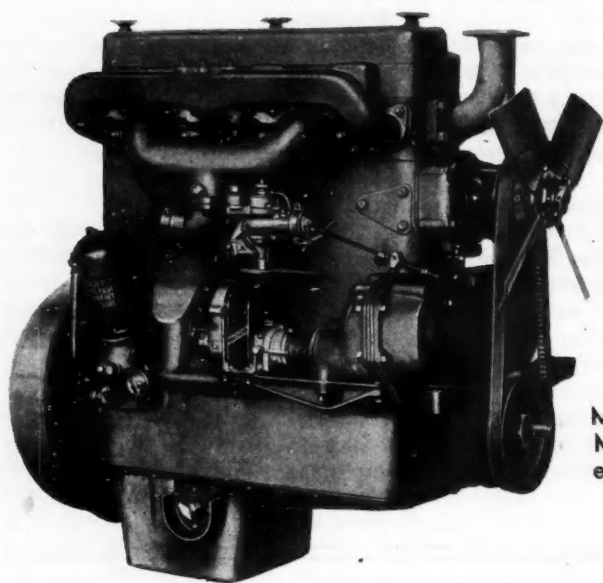
France	1905	173,000
Denmark	1907	306,000
Norway	1915	47,000
Netherlands	1916	496,000
Finland	1917	68,000
Belgium	1920	818,000
Czechoslovakia	1921	1,356,000
Switzerland (11 cantons) ^c	1924 ^a	200,000
Spain ^d	1931

^a In Switzerland, under the national legislation of 1924, the first cantonal compulsory measure and the first cantonal voluntary measure were passed in 1925.

^b The figure given for Germany represents the number covered previous to the beginning of the depression in 1929. As the result of additional limitations in coverage, there were in May, 1934, 16,535,000 persons covered. The official figure, however, is much smaller because of the fact that those unemployed workers who had exhausted their right to insurance benefits, and thus come within the scope of communal relief, are not included in the figures for the numbers covered by unemployment insurance.

^c Seven of the eleven cantons with voluntary measures specify that the communes may enforce compulsory insurance within their borders.

^d For Spain the number insured is not available.



McCormick-Deering
Model PD-40 Diesel
engine, manifold
side

A PRECOMBUSTION-CHAMBER type of Diesel engine has been developed by the International Harvester Company for use in stationary powerplants and for tractors. It is of four-cylinder vertical design, of 4¼ in. bore and 6½ in. stroke, and it develops 56 hp. at its governed speed of 1250 r.p.m. although the rating is only 50 hp. In order to make starting of the engine by hand possible, provisions are made to convert it into a gasoline-burning, spark-ignition engine for starting purposes.

Cylinder shell and crankcase are in a single casting, but separate "wet" liners are fitted. These are provided with a flange at the upper end which enters a counterbore in the block, while at the lower end a seal is effected by means of a rubber ring. This construction has been used by the International Harvester Company for spark-ignition engines for a great many years past. There are four rings on each piston—three compression rings and one oil-control ring, and it will be noted that the top land is very wide. The crankshaft is carried in five main bearings and connecting-rod caps are held on by four bolts each.

All valves are in the cylinder head and the inlet and exhaust valves are operated through pushrods from the camshaft in the crankcase. There are four openings in the bottom of the cylinder head over each cylinder bore, the inlet and exhaust valve ports being nearly on a longitudinal diameter, while the opening for the precombustion-chamber fitting and for a valve designed to convert the engine into a gasoline engine for starting purposes are on the transverse diameter.

Referring to the illustration showing the starting mechanism, by means of a wrench shown at the right, the poppet valve at the left can be opened and then places the working cylinder

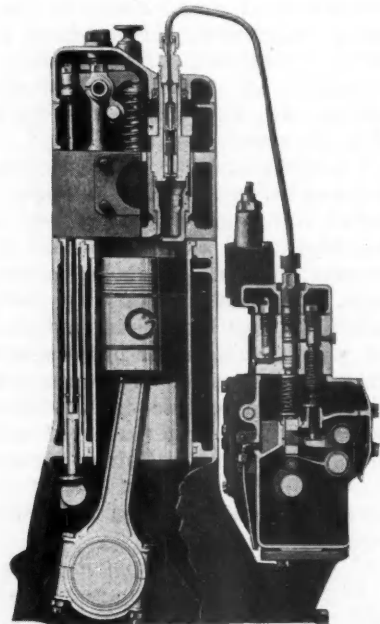
in communication with an auxiliary compression chamber in the cylinder head, the volume of which is such that in combination with the small compression volume in the cylinder proper, it gives the right compression for operation on gasoline. Operation of the starting wrench, in addition to opening the poppet valve between the cylinder and the auxiliary compression chamber, also opens a butterfly valve in the passage from the carburetor to the inlet valves and connects the high-tension magneto which furnishes the spark for starting. It will be seen from the illustration that the spark plug used for starting is screwed into the wall of the auxiliary compression chamber, hence when the valve between this chamber and the engine cylinder is closed and the engine operates as a Diesel, it is isolated and not subjected to deterioration.

Starting is effected by means of a hand crank, and since the compression is reduced, the engine is no harder to crank than a gasoline engine of comparable size. After the engine has picked up its cycle and run up to speed, the governor automatically closes the valve controlling the passage to the auxiliary compression chamber, shuts the butterfly valve in the inlet passage from the carburetor, disengages the magneto and causes the fuel injection system to start functioning.

The fuel injection pump and spray nozzles were developed by the engineering department of the International Harvester Company and are of its own manufacture. The pump is of the spill-valve type and some of its details are shown in the cross-sectional view of the engine. All valves are complete units which are inserted into the pump body and are shown in the drawing in outside view. At the left is seen the suction valve, the space above which is kept filled with fuel by a special gear-driven feed pump shown in outside view above the injection pump

New 50H Diesel

proper. The pump plunger, in the center, is moved upward by means of a cam through the intermediary of a cam lever, and is returned by a spring. During the down stroke of the pump plunger the space in the barrel above the plunger fills with fuel through the suction valve and the passage between the suction valve and the pump barrel.



Sectioned view showing fuel
injection mechanism

During the up-stroke of the plunger, after the suction valve has closed, fuel is forced through the delivery valve and high-pressure line to the injection nozzle in the top of the precombustion chamber. When the proper amount of fuel has been delivered to the cylinder, considering the load on the engine, the spill valve, shown at the right, is lifted from its seat. This immediately relieves the pressure inside the pump barrel, the delivery valve closes, and injection ceases. The remainder of the fuel in the pump barrel is discharged through the spill valve and returns to the fuel supply.

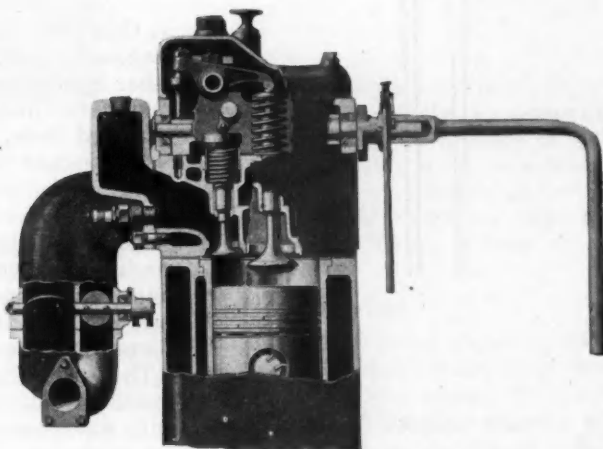
The moment of opening of the spill

0 Hp. McCormick-Deering e Starts on Spark Ignition

valve is controlled automatically by the engine governor. If the load on the engine decreases, for instance, the engine will speed up, and the governor will then turn the eccentric shaft serving as fulcrum for the lever actuating the spill valve so as to lift the valve earlier, thereby reducing the fuel charge injected and holding the engine speed down. Fuel injection takes place under a pressure of 2400 lb. per sq. in.

The pump is built of materials which will withstand the corrosive influences of the atmosphere and any corrosive agencies there may be in the fuel. All reciprocating parts are made of Nitralloy and hardened to 1100 Brinell. All valve parts are of stainless steel and all parts of the pump are parkerized. To prevent grit and other foreign substances from getting into the fuel pump, five stages of fuel filtering are provided. The pump, of course, is a quadruple unit, there being a separate pump unit for each engine cylinder. The governor, which controls the amount of fuel injected by the pump per engine cycle, is mounted at the end of the camshaft.

Sectioned view
showing starting
mechanism



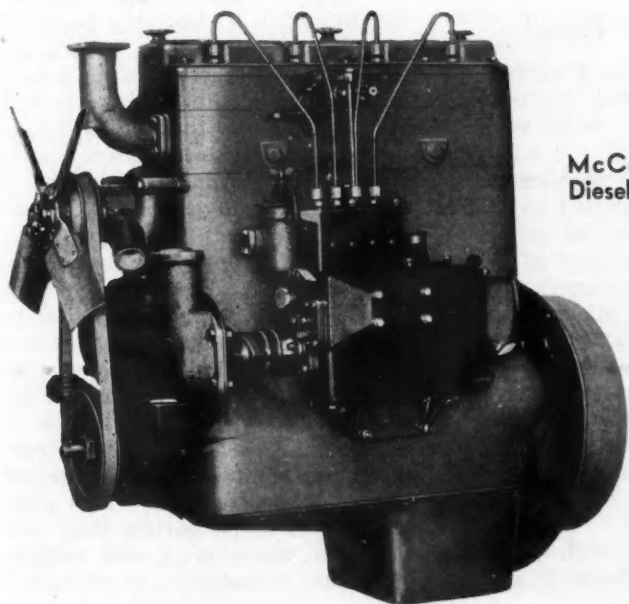
From the horse power curve, which shows 56 hp. at the governed speed of 1250 r.p.m., it is seen that the engine operates at considerably below its peaking speed. The b.m.e.p. at full load and governor speed is about 91 lb. per sq. in. and it increases rather uniformly with drop in speed until it reaches a maximum of 103 lb. per sq. in. at about 475 r.p.m., from which inferences as to the "lugging" ability of the engine may be drawn. The specific fuel

consumption is 0.48 lb. per hp.-hr. under full load and increases to about 0.62 lb. per hp.-hr. at half load.

New Ni-Mo Iron Alloy

CHAMBERSBURG ENGINEERING CO. of Chambersburg, Pa., has developed a series of synthetic nickel-molybdenum air-furnace iron alloys to which it has applied the trade name Cecolloy. While similar alloys have been used in smaller castings, particularly during the past few years, no previous data could be found on castings as large as required in hammer practice and much of the foundry practice used in the development of Cecolloy therefore was original with Chambersburg.

The chief characteristics of Cecolloy are a fine, homogeneous grain structure, a tensile strength of from 40,000 to 60,000 lb. per sq. in., and a Brinell hardness which can be controlled in the furnace to suit the purpose for which the casting is intended. The carbon content can be controlled within limits of plus and minus 0.05 per cent. Cecolloy finishes with a clean, smooth surface, the result of its fine, graphite-free grain structure. While its cost is higher than that of cast iron, it is said to be materially lower than that of steel. Among the purposes for which Cecolloy is recommended is its use in large forming dies.



McCormick-Deering
Diesel engine, pump
side

Buying Policy Should Recognize High Changeover Value of Modern Tools

A PLEA that the high "salvage" value of modern machine tools—for change-over purposes—be taken into consideration in establishing a purchase criterion as to the length of time it takes for a new machine to pay for itself, was voiced by Ralph E. Flanders, president, Jones & Lamson Machine Company, Springfield, Vt., at a meeting held in Detroit recently by the American Society of Tool Engineers.

Mr. Flanders, who is president-elect of the American Society of Mechanical Engineers and a member of the Industrial Advisory Board of the NRA, pointed out that modern machine tools on the whole are special machines with standardized parts. His point was that an analysis as to time required to make a new machine tool pay for itself should be broken down by separating the "durable" elements of the machine tool as to cost from the "special" parts of the machine tool, judging the latter on a one year's period (maximum), and distributing the cost of the first mentioned parts over a longer period.

His plea came at the conclusion of a discussion of the history of the machine tool industry in relation to the automotive industry, in which he divided automotive production since its beginning into four periods.

The first period, that of automotive development and experimentation, he called the "Garden of Eden" of the machine tool industry, since

at that time the industry was using standard machine tools, as used in other industries, and was constantly asking for more and more of these standard tools.

The second period, that of large-scale production, he said, brought in some specialized machine tools. Some automatics began to appear, gradually developing into more and more specialization. This period led into the third period, that of "Continuous production."

This period, sometimes miscalled "mass production," Mr. Flanders said, was characterized by continuous operation of individual machines on individual operations without material change. Standardized automotive design was the order of the day, with little or no change in product. This obviously tended to bring about development of single purpose specialized equipment with little change-over salvage value. This, he pointed out, finally led into difficulties when design stabilization gave way to competitive changes in design. The latter development, which signalized the entry into the present period, put a definite damper on this type of machinery.

The Present Period

The present or fourth period, Mr. Flanders designated as that of "continuous production with constant shifting of design." This has brought about a new requirement in machine tools, he pointed out. The requirements include high output capacity, but also flexibility of design and construction to permit shifting of the machine to other purposes. Tools have to be adaptable to rapid design changes, so that they can be taken down and major parts used again in rebuilding other types of machine tools.

This has led, he said, to the development of special machines with standardized parts. Incidentally, Mr. Flanders mentioned, this has been a boon to the industry, since it

enabled machine tool manufacturers to concentrate on design excellence of the basic or interchangeable parts, including such items as bases, drives, feeds, heads, etc. The result has been increased power at the driving heads, increased durability of basic parts, development of centralized lubrication, the use of better bearings, etc.

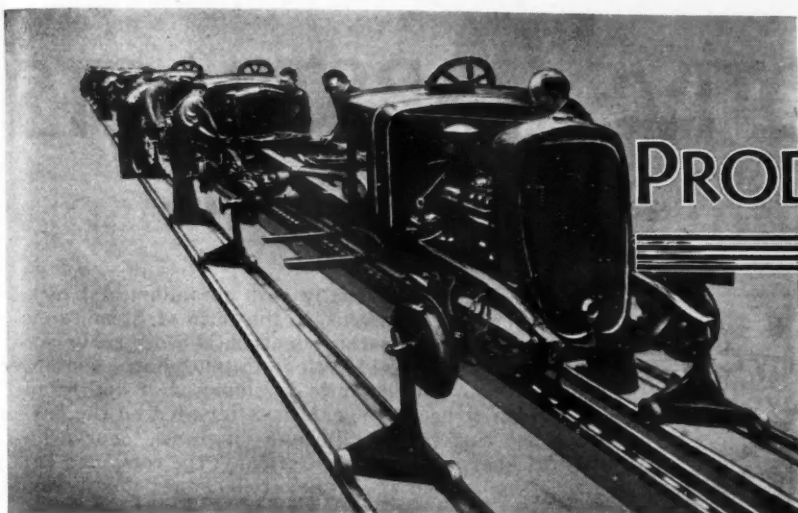
In this fourth period also Mr. Flanders places the peak of research for and development of new processes of production, including automatic gaging on grinders, centerless grinding, surface broaching, diamond boring, etc.

Today, therefore, Mr. Flanders summarized, the following requirements have confronted and have been met by the machine tool industry:

1. Increased excellence of design.
2. Increased adaptability and salvage value for change-over.
3. Offsetting higher machine tool costs, a lower ratio of cost of equipment of cost of output, in addition to lower labor costs.

The increased durability of machine tools, Mr. Flanders said, is, however, the despair of the machine tool builder, and, furthermore, while the industry is requiring flexibility for change-over, there is little tendency to take that flexibility into account in establishing criteria as to whether the new tools would be economical investments. More usually than not, Mr. Flanders said, the entire machine is figured on whether it will pay for itself in one year.

He added one more point as to purchase criterion. When the purchaser arrives at a point where total expenditures, including purchase cost, service and maintenance, retooling costs, etc., for the new machine tool are less than they would be for the old machine used in the same processes, the point of profitable investment has been reached. This point, he said, is much earlier than even suggested methods of cost estimating would indicate.



PRODUCTION LINES

Chemical Brakes

Use of chemical antioxidants is adding thousands of miles' wear to automobile tires, and greatly extending the life of other rubber goods. Lubricating oils exposed to air and either light or heat are now kept from gumming by the same means. A surprising recent development for automobile engine oils is a *crystallization controller*, which, even when used in less than one per cent amounts, prevents thickening of the oil, although the temperature goes down to zero or lower.

A chemical has just been developed which virtually fixes the calcium and magnesium of hard waters, but without removal or precipitation, so that the water may be used for boilers without scale formation.—Arthur D. Little's *Industrial Bull.*, for October.

Gas Analyzer

These new fangled exhaust gas analyzers came in for some pounding at the October meeting of Philadelphia Section, SAE. One of its defenders—an analyzer engineer—contributed the thought that the analysis at idling speed is of real value. The idea is that any tangible improvement at part throttle is bound to correct some deficiency at open throttle. The whole matter is of greatest interest to large fleet operators.

Social Progress

National Industrial Conference Board has just completed a broad survey of group insurance plans which has been published under the title, "Recent Developments in Industrial Group Insurance." It is interesting to note that at the end of

1933, eight large insurance companies had \$8,951,000,000 of group life insurance outstanding. For those who are interested, and that includes most factory executives, this report gives complete statistics as well as a detailed history of the development. The most important point is that group insurance is a practical form of social activity which has spread to vast proportions from modest beginnings.

Heats Patterns

One parts company found that by warming the patterns in its foundry, much better molds could be obtained. It realized that the job could be done best with electric heaters, but the size and shape of the patterns make the mounting of heaters directly on the patterns impossible. Reflector heaters were therefore purchased, 700-watt radiant type heating elements are used, and the pattern is kept sufficiently warm by placing it on a shelf under the heater between operations.—From *A Digest of Electric Melting News*.

Nitrides Iron

Remember some time back we told you about Chapmanizing, a special method of producing a nitrided case in carbon steel parts. We had occasion to talk to them at the National Metal Exposition. The next step is the nitriding of cast irons and malleables with the same type of equipment. It's well worth investigation.

Big Salvage

Here is a thought contributed by one of our friends who is an authority on cutting fluids. Straight cut-

ting oils are not as expensive as one might think, despite a somewhat higher first cost. The point is that this type of material can be salvaged with but little shrinkage. In fact, it is claimed that 80-90 per cent can be reclaimed. Think it over!

Diesel Service

How is the Diesel standing up in service? We don't know first hand but it would be a mighty fine thing to find out. If trouble comes up due to mechanical difficulties or shortcomings in available fuels, it's wise to recognize it and make the necessary correction. Automotive Diesel power has such great potentialities that nothing should be permitted to hinder its progress.

More Light

Some of the latest knowledge concerning the design of interior and floodlighting installations has been collated in the Westinghouse Illumination Handbook, just off the press. It includes tabular data on design standards, wire sizes, lamp capacities, etc. Just the thing for plant engineers and maintenance men. Ask us for your copy.

Oil Change

Some one will have to do something about the theory and practice of crankcase lubricant renewal. Should oil be changed or should it not? At a recent SAE meeting, one well known engineer said that oil change is unnecessary when the engine is equipped with a good oil filter and an oil cooler. Something should be proved one way or the other.—J. G.





AUTOMOTIVE ABSTRACTS

High-Quality Cylinder Gray Iron

THE most important quality of gray iron for cylinder castings is resistance to frictional wear. In comparison with it all other pertinent properties assume a secondary position. The view that the wear resistance should be regarded as the dominant property is supported by the metallurgical fact that with increase in the resistance to wear other mechanical properties, such as static tensile, compressive and transverse strengths, elongation, elasticity and damping value, increase at the same time.

Opinions differ widely as to the composition and the process of production that will give cylinder iron the maximum wear resistance, and it is very difficult to find a criterion that will hold in all cases. This difficulty has its basis in the fact that the wearing process assumes different forms and cannot be so sharply defined as other forms of stress on materials of construction. Wear of engine cylinders is above all frictional wear (this appears rather doubtful in view of the results of a recent British investigation reported in *Automotive Industries* of August 25—Editor). The definiteness of this term unfortunately is somewhat beclouded by differences in the actual wearing process that are hidden behind it, such as a low or high rubbing speed, good or poor lubrication, the presence of foreign particles in the space occupied, including dust in the intake air and particles of burned oil, more or less severe scraping of individual rings, and more or less imperfect cooling. These are all factors which result in different rates of wear even in a high-grade material, regardless of the composition.

In addition to these there are stresses on the cylinder walls which are no longer frictional in character and which produce effects that are more in the nature of hammer blows, which when sufficiently intense and sufficiently long continued, result in permanent cold deformation of the material. Most dangerous of these actions are the so-called "canting" of the pistons in the cylinder bores, in the dead-center positions, the rattling of piston rings in worn-out ring grooves, vibration of the entire car in operation (road shocks) and vibratory shocks of the connecting rods and crankshafts due to worn-out bearings. These variations in the demands on the material are responsible for the fact that the wear of cylinders in practical service cannot be predetermined by means of laboratory tests for the simple reason that the test conditions are too nearly uniform, in contrast to the constantly changing conditions of every day service.

The article under review discusses cylinder irons, and particularly the newer quality irons, at great length, under the following heads: Fundamentals of the Grain Structure of Cylinder Cast Iron; Chemical Composition and Grain Structures of Cast-Iron Cylinders Subjected to Tests, and Systematic Development of High-Quality Grain Structures through (a) action on the chemical composition of the cylinder iron, (b) special treatment of cylinder iron melts of given chemical composition and (c) molding and foundry practices for a given melt.

The article includes a table giving chemical compositions of cast irons used in 43 different engines, including 16 of American manufacture. It concludes that high-quality cylinder irons should show a pearlitic or sorbitic structure in which there are few fine graphite streaks. The metallic

mass can be produced optionally with chromium and nickel or without these. Phosphorus, in the form of Steadite embedded in a pearlitic or sorbitic matrix, is a desirable component and there are no objections to phosphorus contents up to 1 per cent. A systematic development of high-grade cast iron grain structures should be attempted on the basis of established cast iron equilibrium diagrams. For cylinder-wall thicknesses current in Germany, the combined carbon and silicon percentage (which determines fluidity and "life") should range between 4.8 and 5.3 per cent for automobile cylinders, and between 5.00 and 5.3 per cent for motorcycle cylinders. Choice of the raw materials (kind of pig) and the treatment of the melts (overheating, settling, shaking and refining) and a competent molding and pouring practice are further requirements in the production of high-class cylinder castings.—H. Reininger, A. T. Z., Sept. 10.

Utilitarian Aesthetics of Body Design

THERE are several factors which influence car appearance, and a combination of all produces the final result, which is attractive to the public in a major or minor degree. These several factors are:

1. The shape of the body
2. The color scheme
3. The quality of the finish
4. Superficial embellishment.

It is assumed that the shape has been decided on and is therefore fixed. The color scheme is important, not so much from the point of view of one car painted black as compared with another painted white, but from the point of view of two cars painted black and white with the painted areas so disposed as to alter the apparent shape of the car. This is the basis of camouflage which disguises the shape of the car to a greater or lesser degree.

Color should tend to flow along the body lines and should not be put on in patches. Matt finish allows the eye to see exactly what the shape is, whereas a bright finish tends to reflect and to confuse the shape. A highly polished finish, however, improves the appearance of an article if the shape is simple and not complicated. For instance, a polished steel ball is beautiful, whereas a rough cylinder casting painted in glossy black looks inaccurate and fussy. This matt finish, however, is impractical from a utilitarian point of view.

Superficial embellishment is likely to be of considerable importance in the future, as distinctive embellishments make it possible to readily recognize the make of car. Several bad examples have been introduced fairly recently and will ultimately disappear. Among these are bright vertical doors in hoods, a curved or wavy line extending from the radiator filler along the hood and cowl to the waist line of the body, and projection of the windshield pillar line downward and toward the front mudguard, thereby tending to cut the body in half.

In the past, when bodies were designed with little attention to streamlines, mascots were reasonably popular, but they were usually of "stable" design, frequently taking the form of a female head. More recently the element of speed has been introduced in these designs. If the mascot persists, it will become necessary to design it with regard to the rest of the car, that is, it must not only be individual, but it must be decorative and streamlined.—W. O. Kennington, *I.A.E. Journal*, October.

Bohn Reveals Combustion Chamber Design Formulas



David E. Anderson, Bohn
Chief Engineer

MATHEMATICAL pre-determination of major combustion chamber dimensions forms part of design methods announced by Bohn Aluminum and Brass Corp. this week. While the derivation of the formulae used has not been revealed, it is apparent that they are based on a general shape of combustion chamber found to be advantageous by Bohn Aluminum in designing its aluminum cylinder heads.

Fig. 1 shows a plan and an elevation of a typical Bohn chamber. In this the length L of the chamber as measured from the spark plug gap is determined by the formula

$$L = \frac{S}{1.5 \text{ to } 1.55},$$

where S is the stroke of the engine. The object of proportioning chamber length to stroke is of course to time flame propagation with the movement of the piston.

This presupposes a definite location of the spark plug, and Bohn engineers state that particularly satisfactory results are obtained by locating the plug on a line connecting the axes of the two valves and

70 per cent of the distance between the two axes from the axis of the intake valve.

Control of filling characteristics is assured by mathematically pre-determining the dimensions of those parts of the chamber which are found to be critical in this connection. This determination is based on the piston displacement of the cylinder. The area of the section of the chamber through line A is determined by the following formula:

$$A = \frac{D}{17.5 \text{ to } 18.5},$$

where A is the area of the throat and D the displacement of the cylinder. Similarly, the areas of the vertical sections of the combustion chamber at B and K , overlying the cylinder bore, are determined by the formulae

$$B = \frac{D}{19 \text{ to } 20} \text{ and } K = \frac{D}{12 \text{ to } 13}$$

The areas of the remaining portions of the chamber are based on the valve diameters and the relationship between valve diameter and cyl-

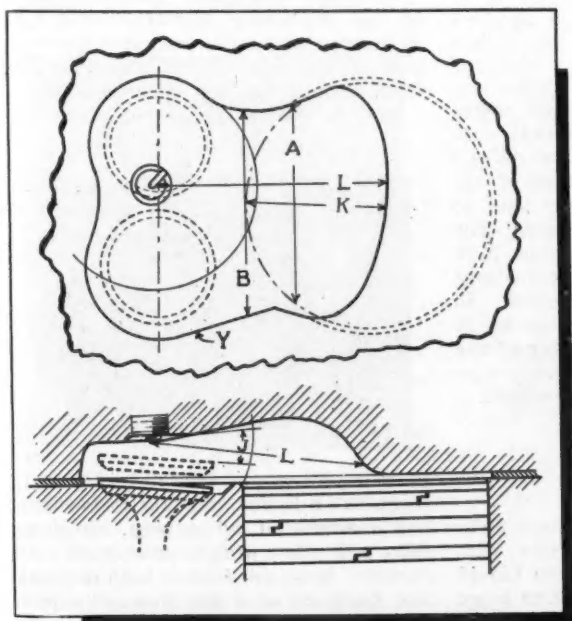
inder bore. The volume over the cylinder bore is generally figured at around 30 to 35 per cent of the total chamber volume, this proportion having been found to give maximum control over the pressure rise per degree of crank travel.

It will be noted that wall Y , adjoining the intake valve, is straight from the intake port to the cylinder. This arrangement is intended to assist in filling the cylinder by eliminating obstructions to the flow of gases. On the other hand, the wall adjacent to the exhaust valve is so shaped as to insure relatively free flow of the fuel mixture into the remote part of the valve pocket.

Experiments have shown, it is stated, that an angle of 10 deg. between the top of the intake valve and the adjacent surface of the top wall of the chamber is beneficial, and sufficient for satisfactory results. The same angular relationship is recommended for the exhaust valve, in order to insure the best scavenging conditions.

The clearance around the intake valve, between the rim of the valve and the wall of the head, should run close to one-tenth the valve diameter, while the clearance around the exhaust valve can be slightly less, owing to the fact that the exhaust valve is usually smaller than the intake.

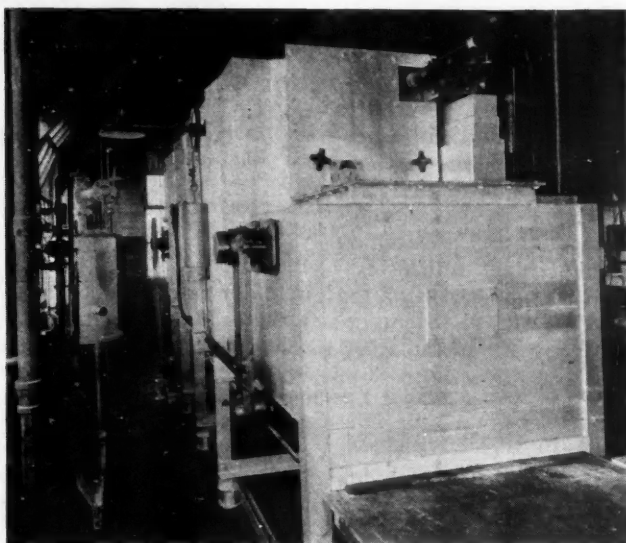
Design constants given in the foregoing are based on the use of gasoline of 70-octane value and an average compression ratio of about 6.3. If fuel of higher octane value is to be used, which burns more slowly, the effective length of the chamber has to be reduced, while for fuels of lower octane value the reverse holds true. Therefore, with other fuels the design constants are different and the proportions of the chamber change.



Plan and elevation
of typical
Bohn combustion
chamber

NEW DEVELOPMENTS

Automotive Parts, Accessories and Production Tools



Continuous Scale Free Hardening Furnace

A special atmosphere, continuous chain belt conveyor furnace for the scale free hardening of miscellaneous small and medium size products has been developed by The Electric Furnace Company, Salem, Ohio.

The material to be treated is fed onto a rugged, cast link belt conveyor, conveyed through the furnace in a special protective atmosphere and discharged through a sealed chute to quench. The

material comes out free from scale and without decarburization.

A combustion type generator is provided with each furnace for supplying the special protective atmosphere used in the equipment.

This type of furnace may also be used for bright annealing, clean annealing and brazing or jointing of metal parts.

The accompanying photograph shows the charging end of the furnace, the gas generator is shown in the rear.

New Insulation For Electric Wires

A new insulating material for electric wires is announced by United States Rubber Products, Inc. It is known as Laytex and is derived from latex, the milk of the rubber tree. All proteins, sugars and other water solubles are removed by a patented process, and the material is said to excel in flexibility (750 per cent stretch), tensile and compressive strengths (5,000 lb. per sq. in. tensile), and high dielectric strength, which latter permits of the use of thinner coverings of insulating material.

The conductor is run through a series of baths of the liquid and in each bath a film of insulation is formed on it, which sets almost immediately. In fact, the film has solidified before any

particular part of the conductor comes in contact with any mechanical support, which obviates mechanical defects in the insulation. The method of application of the insulation is said to guarantee uniform thickness. The resistivity is said to be twice as high as called for in A.S.T.M. specifications for best-grade rubber compound. In certain applications a reduction of 25 per cent in the outside diameter of the insulated conductor has been made possible, and 50 per cent in the weight.

Perlton a New Carburizer

E. F. Houghton & Co., Philadelphia, Pa., has just announced a new carburizer for small work—Perlton Liquid Carburizer. It has been tested in large automotive plants in this country

with results which the manufacturer states will "revolutionize the science of carburizing small parts."

It is said to have given twice to three times the penetration in a given time as compared to other methods now in use—a factor most important in the speed of modern production. A pot life of up to 1200 hours was also shown by Perlton, which compares to an average of from 300 to 500 hours for other liquid salt bath mediums.

The Perlton Process is said to be true carburization; the same type of carburized case is obtained as produced by any of the solid carburizers requiring pack hardening. Perlton is especially adapted for carburizing work requiring a depth of case from skin hardness to 0.04 inch. The surface can be ground and leave a file-hard surface, provided the grinding does not extend beyond the eutectoid area.

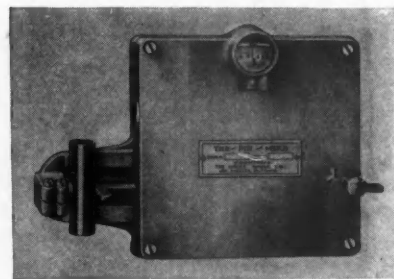
A Purolator for the Ford V-8

A Purolator for Ford V-eight engines has been placed on the market by Motor Improvements, Inc., Newark, N. J. No holes need be drilled in the crankcase, and the device can be removed in five minutes or less. The bracket supporting the Purolator is fastened to two cylinder-head studs and oil is drawn from the crankcase by replacing one of two plugs back of the left bank of cylinders with a hollow 1/4-in. pipe plug, from which oil is conveyed to the Purolator through 3/16-in. copper tubing. Filtered oil is returned to the crankcase from the Purolator through another copper tube and is led into the crankcase through a hollow cap screw replacing one of the screws holding the fuel pump in place.

The Pin "Mike" Now Sold by Wilkening

Arrangements have been completed by the Wilkening Manufacturing Co., Philadelphia, for the exclusive distribution of the Pin "Mike" made by the Circle Gauge Co., Los Angeles, Cal.

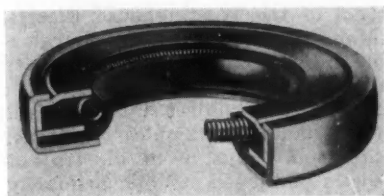
The Pin "Mike" is a precision instru-



ment used for quickly measuring the diameter of wrist pins, bushings, bolts and other pins to micrometer accuracy. Sizes are read in both decimals and fractions on a dial through a powerful magnifying glass.

National Oil And Grease Seal

Development of a new oil and grease seal known as Type BB is announced by the National Motor Bearing Co., which has just completed removal of its factory from San Francisco to Oakland, Calif. The new seal, which is claimed to completely exclude extraneous matter and to positively retain oil, grease and other fluids, consists of a steel case which locks the seal assembly

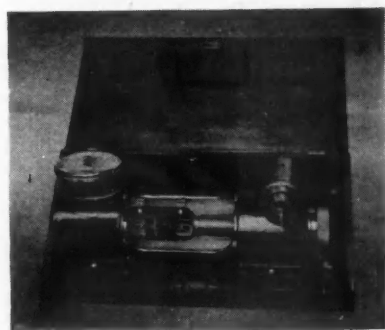


permanently. The outer case has a press fit and is made with tolerances of plus and minus 0.002 in. An equalizing annular garter spring within the case presses against the sealing member over the whole circumference.

The actual sealing member, which contacts the moving shaft, is made of different materials (usually a processed leather) to suit different conditions of temperature, peripheral speed, unbalanced pressure and chemical activity. A new type of leather known as Sae-tan has proved particularly popular.

Portable Tensile Tester

A tensile testing machine of 4000 lb. capacity, weighing only 25 lb. has been introduced by the Detroit Testing Machine Co., Detroit, Mich. This device is said to combine accuracy and other essential features of the larger laboratory machines with light weight and portability. It is recommended also



as an aid to salesmen and others for demonstration purposes as it may readily be adapted to specimens of all kinds within its capacity. Occupying very little space, for laboratory work it is simply attached to a bench or table top. Where portability is a requirement it is mounted in a carrying case approximately 5 x 7 x 15 in.

Automotive Industries

NEW DEVELOPMENTS

Automotive Parts, Accessories and Production Tools

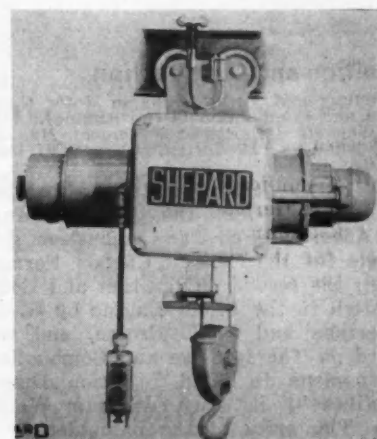
Hoist With Five Speeds

The Shepard Niles Crane & Hoist Corp., Montour Falls, N. Y., has just brought out two hoists of 3½ and 7½ hp. rating featuring a selective five speed controller which gives the operator a push button control for creeping, acceleration and deceleration.

The five speeds are controlled from one button. The operator, increasing the pressure of his thumb, feels the change as each of the five independent speeds is obtained when the button is pressed or released.

All five speeds are usually obtainable for lowering, regardless of the load. In hoisting, however, the percentage of rated load being lifted determines the number of speeds available. Thus, full loads will not move upward until the push button is pressed to the 3rd or 4th point.

It may happen that one speed point



will give slightly insufficient torque to keep a load in motion and the next point will give a torque too high for very slow speed. In such cases, it is entirely practical to "jog" the push button between the two contacts.

Designed for Turning Steep Angle Tapers

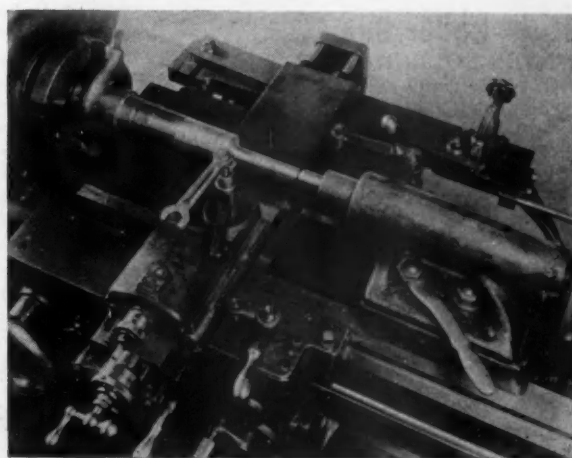
Reed-Prentice Corp., Worcester, Mass., offers a new type taper attachment for lathes.

Designed to retain all the advantages of the telescoping cross feed screw type of attachment and arranged so as to be used as a conventional type taper attachment if desired, it is capable of turning any included angle up to 120 degrees.

This attachment permits of turning

a straight portion on the work to a predetermined point, then the taper attachment may be engaged and the taper turned to another predetermined point where it may be disengaged and the machine will resume straight turning. A scale at the left hand end of the taper bar permits setting to the desired included angle of taper.

The attachment is also made for forming and is unique in that the master form has greater length than the form produced on the work, thus permitting use of a roller follower for relatively sharp corners.



Reed-Prentice offer a new taper attachment for lathes

November 24, 1934

Book Reviews —

Ignition and Combustion

Zündung und Verbrennung in Motor (Ignition and Combustion in the Engine). Forschungsheft (or Research Paper) No. 366 published by VDI Verlag, Berlin NW7, Germany.

THIS publication contains three papers in German, the first by Dr.-Ing. G. Ackermann on The Combustion Triangle for the Case of Carbon Formation; the second on Ignition and Combustion in the Diesel Engine by G. D. Boerlage and J. J. Broeze, and the third on The Ignition and Combustion Phenomena in Solid Injection Diesel Engines by Dr.-Eng. Wolfram Wentzel. The price of the pamphlet is 5 marks.

* * *

Machining and Material

Zerspanung und Werkstoff—Ein Handbuch fuer den Betrieb (Machining and Material—A Handbook for the Production Engineer) by Dr.-Ing. Ernst Broedner. Published by V.D.I. Verlag, Berlin.

THIS is a handbook or compendium covering modern machine shop practice. Best forms of cutting tools, including the rake, are given for such machining operations as planing, drilling, turning, reaming, thread-cutting, broaching, milling and grinding. There is also much information in the book on the proper operating conditions, such as speeds, feeds, depths of cut and coolants. A great deal of experimental work has been carried out in Germany in recent years in connection with problems of optimum conditions in the machining of metals, and the results are summarized in this work. It is more of a reference work than a text, but a comprehensive bibliography is included, so those particularly interested in any special subject may look up the original sources.

* * *

Taper-Roller Bearings

TAPER-ROLLER BEARINGS (Second Edition)—Simplified Practice Recommendation R-67-33. Copies obtainable from the Superintendent of Documents, Washington, D. C., at 5 cents each.

* * *

Guide to Automotive Lubrication

Service Man's Guide to Automotive Lubrication, J. Howard Pile, editor. Published by the Check-Chart Corporation, Chicago, Ill.

THE title fully explains the character of this book. It is an elementary treatise showing why lubrication is needed between parts sliding over each other, explains the properties of lubri-

cating oils and tests of such oils, and describes in considerable detail with the aid of numerous illustrations how the parts of automobiles are lubricated. Incidentally, a good deal of the mechanism of the automobile is described.

* * *

Trimming Motor Vehicles

Trimming Motor Vehicles, by C. B. Brooks. Published by E. & F. N. Spon, London. New York—Engineers Book Shop, 227 Park Ave.

M. R. BROOKS is instructor in coach trimming in the Government Training Center, Park Royal, and the lack of a suitable textbook on the subject induced him to write this book. The subject is handled in a practical way, the student first being made acquainted with the different tools and materials used in the art. Next the various elements of the upholstery are taken up, such as squabs and cushions, mattress cushions, bucket seats, etc. Tops, top boots, curtains and such equipment, very rarely used on American cars at present, are also dealt with. It may be pointed out that the British terminology is rather different from that used in the trade in this country, the rather quaint expression "hood sticks" being used for what we call top bows. Machinery used in mass production of upholstery is also dealt with, and instructions are given for using the Singer sewing machine.

* * *

Mechanical Vibrations

Mechanical Vibrations, by J. P. den Hartog. Published by McGraw-Hill Book Co., New York.

WITH the increase in speed of all kinds of machinery, problems of mechanical vibration arise very frequently in engineering work, and quite properly more attention is being paid to this subject in engineering courses in recent years. There is probably no other line of engineering work in which vibration troubles have been so varied and so numerous as in automobile engineering. First we had excessive engine vibration from unbalanced engines of less than six cylinders. When this was cured by the use of six or more cylinders, right away we ran into other forms of vibration—torsional vibration of crankshafts, surging of valve springs, etc. Then there are the various forms of chassis vibration having their origin for the most part in road shocks.

Professor den Hartog has taught the subject of Mechanical Vibration for a number of years, first at the Design

School of the Westinghouse Electrical & Manufacturing Co. in Pittsburgh and more recently at Harvard Engineering School, and he has expanded his lectures on the subject into a regular treatise, adding examples of vibration troubles in industry to illustrate the theories developed. While primarily a textbook and containing numerous examples for the student to work out, it is also intended for the practicing engineer. The various types of vibration encountered in automobile engineering, such as engine vibration due to unbalanced reciprocating parts, torsional vibration of crankshafts, vibration of automobiles on their springs, shimmy, etc., are covered in considerable detail.

* * *

Lubricating Oil Tests

Lubricating Oil Tests—A Practical Interpretation of Their Significance, by James I. Clover, assistant professor of machine design, Virginia Polytechnic Institute. Published by the Virginia Polytechnic Institute, Blacksburg, Va.

AS the title of this bulletin indicates, it describes the various tests employed in testing lubricating oils, illustrates the apparatus used, and comments on the significance of the results of the various tests. The bulletin is well written and gives the essential information on tests of lubricants in simple language. It distinguishes between tests designed merely to determine the suitability of an oil and tests designed to determine its quality.

* * *

Publications Received

EQUILIBRIUM Volatility of Motor Fuels from the Standpoint of Their Use in Internal Combustion Engines, by Oscar C. Bridgeman. Research Paper No. 694 of the Bureau of Standards. Obtainable from the Superintendent of Documents, Washington, D. C. (10 cents.)

SERVICE Characteristics of the Light Metals and Their Alloys, prepared by Sub-Committee VII of Committee B-7 on Light Metals and Alloys. Published by the American Society for Testing Material, 260 South Broadway, Philadelphia, Pa.

INFRA-RED Radiations from Explosions in a Spark-Ignition Engine, by Charles F. Marvin, Jr., Frank R. Caldwell, and Sydney Steele. Report No. 486 of the National Advisory Committee for Aeronautics. Obtainable from the Superintendent of Documents, Washington, D. C. (10 cents.)

Litchfield Outlines Job Insurance Plan

(Continued from page 639)

"The commission which undertakes the study probably should be made up equally of members representing industry, labor and government," Mr. Litchfield said. "For the present it appears that the original plan should concern itself with industrial unemployment rather than to risk the complications which undoubtedly would confront any attempt to embrace other and less uniform fields of employment.

"In general, the plan for our nation should follow established insurance methods. It should be guided by the federal government, and at the outset should be sufficiently flexible to permit of change as experience would indicate changes should be made.

"I believe the reserves should be built from assessments against employers and employees with no part of the funds coming from the public treasury except in case of extraordinary drains upon the reserves during severe depressions.

"Whether the assessments against employers and employees should be on a basis of uniform, flat payments or percentages of wages could best be determined by the study. Frankly, I could not hazard a guess. But if the assessments are made on a percentage basis, then it should follow that the workers paying the most money into the reserves should be entitled to commensurately higher relief benefits than those who contributed less.

"The effect of assessing the cost against employers and employees would be to reduce the hazards. Just as fire insurance premium payers are required to eliminate fire risks from their own premises, so would employers be likely to seek earnestly for ways and means of reducing unemployment to the end that their premium costs would be held to the lowest possible figure.

"The most essential requirement of any plan is that it be susceptible to honest, sincere administration and free from provisions which might offer temptations to the political manipulator. That is a pretty big order, I confess, but it can be filled if the problem is approached from the proper angle."

Clyde Motors Reported Ready for Production

The Clyde Motors Products Co., Clyde, Ohio, is reported to have placed orders for materials for the first of the Diesel oil engines the company will manufacture. According to the company these first engines, for truck purposes, are already sold to fleet operators in Ohio and Michigan. Additional inquiries, it is said, have been received from the Caribbean Petroleum Co., Venezuela; Motors, Ltd., of Colombo, Ceylon, and Kemsley, Melbourne, Australia.

The report indicates that the company will be in regular production by the turn of the year. Officers of the organization are A. C. Burch, president; E. B. Arnsbarger, vice-president; J. N. Traylor, secretary and treasurer.

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November 24, 1934

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